The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Chemistry and the Coal Report

THE Coal Commissioners, in summarising the conclusions in their report, express their firm conviction "that if the present difficulties be wisely handled, if the grievances of the one side and of the other be remedied, and a better spirit prevail in consequence between them, the mining industry, with the aid of science, will certainly recover and even surpass its former prosperity. It will again become a source of great economic strength to the nation." By "science" is meant principally the sciences of chemistry, physics, and engineering, and if any one doubts the part which industrial and engineering chemistry is to play in saving the national coal industry a study of this valuable report should promptly remove it. Research is laid down by the Commissioners as one indispensable condition of success. Efficient mechanical equipment and organisation is another. The proper utilisation of the mineral and the full extraction from it for national use of its most valuable constituents is a third. These and many other aspects of the problem are thoroughly explored in the report. A few comments on them is all that is possible here.

Take first mechanical equipment. The Commissioners dismiss at once the theory that the remedy lies in lengthening hours and lowering wages and the charge that the present trouble is produced by political unrest or restriction of output among the miners. The disease is deeper than any of these things and the remedy must be equally thorough—nothing less than a complete reorganisation will meet the case. As regards output per miner, the United Kingdom still comes next to America with from 200 to 300 tons per man per year—not very much below what it was in 1874–78. In the United States the output is 700 tons per man, and the difference is largely accounted for by machinery. The use of coal-cutting machinery in Great Britain dates practically from the beginning of the present century. In 1901 only 1½ per cent. of the total output was cut by machinery; by 1924 the proportion had grown to nearly 19 per cent., slightly less than one-fifth of the total. In America at the beginning of the century 25 per cent. of all the bituminous coal was cut by machinery, and the proportion is now nearly 70 per cent. Although the conditions are different, the Commissioners' conclusion is that in some ways machinery is needed here even more than in America, and that the services of our mining engineers, "second to none in skill, experience, training, and ingenuity," should be applied to bringing our mines to the level of the best.

Again, as regards our resources, there must be vast stores of coal below the level of 4,000 feet, which is regarded as the lowest workable depth, but the Commissioners hold out a distinct hope that the engineering science of the future will find means to work minerals at greater depths. In the Transvaal already experiments in deeper mining are being made. The development of systems of ventilation has made little progress for many years, and it is by no means impossible, the Commissioners think, that research may discover such improvements in ventilating methods as would enable these deep levels to be mined, without discomfort to the workers.

The chapter of the report which deals with "Research" is one that the chemist should certainly not miss, nor yet that which deals with the "Utilisation of Coal." The wastefulness of the present system is brought out by a few figures. Altogether some 37 million tons of coal are treated in ways which split up the mineral into other fuels and recover valuable by-products, but we still consume in the raw state, by grossly unscientific methods, over 147 million tons. About four times as much coal, therefore, is still burnt in this country in the raw state as is carbonised before consumption. In all these matters the Commissioners insist that a thorough scheme of research is necessary, carrying on to completion the excellent work already in progress on destructive distillation at both high and low temperatures, pulverising for the production of

colloidal fuel, liquefaction of coal by the Bergius process, and synthetic methods for the conversion of water gas mixed with hydrogen into liquid fuels suitable for use in internal combustion engines.

The Mining Association are sympathetic towards such research and prepared to help without actually taking the initiative, but this attitude, in the opinion of the Commissioners, indicates an insufficient appreciation of the importance of the question. They recommend that a great comprehensive research organisation should be established, that a director of research having high qualifications in physical and engineering science should be appointed, and a research headquarters established. Further, it is urged that mining should be more closely associated with other industries, such as gas, electricity, smokeless fuel, oil, chemical products, blast furnaces and coke ovens, and that the Government should establish an official system for the sampling and analysis of coal, with a view to encouraging selling on specification and guarantee in both home and foreign markets. We have but touched on some of the leading features of the report, but enough has been said to indicate its interesting character, the complexity of the problems to be solved, and the part that science, especially chemical science, must play in finding the solution.

Drying Oils and Cellulose Lacquers

In his speech (reported in our issue of last week) at the annual dinner of the Oil and Colour Chemists' Association, Dr. H. H. Morgan referred to a problem which within recent years has been causing a certain amount of apprehension in the paint and varnish industries, and which has given rise to a good deal of speculation as regards the future of drying oils. As Dr. Morgan said, whenever a group of oil and colour chemists get together, conversation can almost surely be calculated to drift on to the subject of cellulose lacquers. There is no question that the modern ranges of nitrocellulose varnishes are capable of giving remarkable effects in the way of beautiful, tough, and hard films, and by reason of their many valuable properties they have come rapidly into favour, having for many purposes replaced stoving and air-drying varnishes and enamels. It is remarkably interesting to recall, however, that the use of solutions of the kind was first recorded about seventy years ago. Since that time the science of the subject has gone continuously ahead, and possibly the greatest drawback which has precluded the general adoption of such solutions is the danger associated with their preparation and use. It has, in fact, been said that in spite of their exceptionally valuable properties, a time will come when, solely owing to the risks involved, cellulose lacquers will have to give way to other substances.

Whatever the advantages and drawbacks of the new materials, however, it is encouraging to find that Dr. Morgan is far from being a pessimist so far as the future of drying oils is concerned. He is rightly of the opinion that the paint and varnish industry can combat all such new problems if those engaged in it will get to know more about the materials that the industry supplies. It is instructive, too, to point to an American opinion that was recently expressed on the same subject, for it has been stated that the recent expansion in America of the lacquer industry (following the discovery of mass production of butyl alcohol and its recognition as a suitable solvent for nitrocellulose) has not in the least restricted the import of varnish gums or oils. On the contrary, those imports increased to a very marked degree during the past year, and the varnish industry enjoyed what was regarded as the most prosperous year in its history. That the lacquer industry has expanded is generally known, but new uses are being found for both varnishes and lacquers arising from intensive efforts on the part of lacquer manufacturers to extend the scope of their field, and also due to the varnish manufacturers similarly undertaking research to prevent the lacquer industry from encroaching on their outlets.

If, therefore, events have taken this promising course in America, there is surely no reason to suppose that our own chemists are incapable of similarly rising to the occasion. They are faced with another of those instances, to which we are becoming so accustomed, of a synthetic product stepping in and taking the place of a natural product the position of which, appeared, perhaps, unassailable. Experience has shown in almost every case, however, that while the output of the natural product tends to be prevented from expanding in any marked degree, it seldom shows any declension, and at least it may be regarded as a factor beneficial to the community as a whole that synthetic production does preclude prices from rising to artificial and unwarranted levels.

The New Rice Crystal Sulphate

Much has been heard of late respecting crystalline forms of sulphate of ammonia, more especially the needle crystal produced at certain gasworks in this country, and the pea crystal first put on the market by Germany and now produced at Billingham by the synthetic process. An extremely interesting sample has just reached us of sulphate of ammonia in what is called the rice crystal form, some quantities of which have been produced at a British gasworks, though it has not yet been put commercially on the market. The crystals are roughly one-fifth of an inch long and about the thickness of ordinary pin wire, very clean and compact in structure, and slightly grey in colour.

The purely chemical properties of the new crystal as a fertiliser are probably not materially different from that of any other high-grade quality of sulphate, but its physical form raises some interesting questions respecting the caking and distribution problems and the availability of its nitrogen content for the nourishment of plant life. Owing to the improvement of processes and the demand for improved quality, nearly the whole output of sulphate in this country is now of the neutral grade and also in varying degrees non-hygroscopic. For the purpose of rapid mechanical distribution—not at all an unimportant point—it is obvious that a fine friable salt is the most convenient form. The disadvantage is that with a certain degree of moisture it tends to cake, and it has recently been found that this defect has resulted in a very serious loss of Far-Eastern trade. The fine needle crystal reduces this liability and being very fragile in structure it distributes almost if not quite as readily as the

powder form. The pea crystal, though larger, is also convenient for distribution owing to its spherical form, and its shape also renders it less liable to cake. The rice crystal is equally free from the latter risk, perhaps even more so, but in the form of these minute bars it may possibly not be so convenient for mechanical distribution. The interesting point, however, it establishes is the control that the chemist or engineer has already obtained over the crystallisation process, and his ability in the long run to produce whatever crystalline shape and size experience shows to be the best for keeping, for distribution, and for the ultimate purpose of feeding plant life. The technical advances made in this field are matter for sincere congratulation.

As in the case of dyestuffs and indeed every other product, the verdict of the user is the only conclusive one. Considered simply from the fertiliser point of view, which is the form—powder or small crystal or larger crystal—that serves the nitrogen in the most palatable and constant form to plants? The answer seems to depend on conditions. A fine powder, which dissolves readily in the soil, might be the most serviceable form, but it is liable to be washed through by heavy rain before the roots have taken it up. The larger crystals, dissolving more slowly, would not be washed away so readily; on the other hand, in dry weather, the liberation and distribution of the nitrogen food would be less immediately effective. In this matter, it is difficult to decide definitely on any one form without regard to conditions, and only experience can decide which attains the best results according to climate, the physical condition of the soil, and the habits of the crop to which the fertiliser is applied.

Volumetric Glassware Tests

It will be remembered that some time ago the National Physical Laboratory issued a pamphlet on "Tests on Volumetric Glassware Used in Dairy Chemistry," with standard N.P.L. marks to indicate that glassware so stamped had been duly tested. The director, Sir J. E. Petavel, has now sent out a slip to replace page 14 of the pamphlet. From this it appears that in future, butyrometers, milk test bottles, and milk pipettes submitted for test and found to comply with the regulations will be etched with the laboratory mark.

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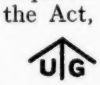
This mark is a combination of the Laboratory monogram, and the date of test with the letter B to indicate that the apparatus meets with the Class B regulations. The National Physical Laboratory is also authorised under the Dairy Industry Act (Act No. 16 of 1918) of the Government of the Union of South Africa to test glassware used in the testing of milk and cream, and required to fulfil the regulations under Section 20 of the Act, and to etch the mark



on each vessel found to comply with the requirements of the Union of South Africa. When 12 or more instruments of the same type and capacity are sent together for test, a reduction of 33⅓ per cent. is made on the fees—namely, butyrometers or test bottles, 1s. 6d. per vessel; milk pipettes, 2s. 6d. per vessel.

France and the Fuel Oil Problem

During the past few years, France certainly has been setting to work with a will to solve the problem that Nature has set her by not endowing her with means for producing oil fuels commensurate with her requirements. Suggestion has followed suggestion, legislation of a somewhat burdensome nature has been introduced, considerable sums have been spent in research, and yet the solution seems as elusive as ever. To the highly practical English mind some of the artifices resorted to must have savoured of the ridiculous, and the complications associated with the latest scheme announced would scarcely recommend it to the care-free motorist in this country.

Exhaustive experiments are now, however, being conducted in Paris, and it is said that, if they are successful, "an entirely new field of research may be opened up for the production of cheap motor fuels." The new fuel for which such hopes are entertained consists, we note, of a mixture of about 65 per cent. of benzol, 25 per cent. of gas oil, and 10 per cent. of schist oil. This mixture is fed to the carburettor in the customary way, but adjoining the latter is a device for admixing acetylene gas with the sprayed oil. So far it is claimed that, as compared with petrol, the new mixture gives an economy of 50 per cent. in running costs, but although the proposition may have its interest, we imagine that it will scarcely solve the difficulties of our fellow motor users across the Channel.

The Calendar

Mar.		
22	Chemical Industry Club: "The Sensibility of the Photographic Plate." Dr. T. Slater Price. 8 p.m.	2, Whitehall Court, London, S.W.1.
23	Institution of Petroleum Technologists: Annual General Meeting.	Aldine House, Bedford Street, Strand, London.
23	Institute of Chemistry and Society of Chemical Industry (Edinburgh Sections): "The Early History of Ring Closure." Professor Sir W. H. Perkin. 8 p.m.	36, York Place, Edinburgh.
25	Chemical Society: Annual General Meeting. 4 p.m.	Manchester.
25	Institute of Chemistry Students' Association (London): Debate. 8 p.m.	30, Russell Square, London.
25	Society of Dyers and Colourists (Bradford Junior Branch): "Dry Dyeing." J. S. Heuthwaite.	Bradford.
25	Worshipful Company of Dyers: "The Dyestuff Industry and the State." Dr. Herbert Levinstein. 6 p.m.	Dyers' Hall, Dowgate Hill, London.
25	Institute of Chemistry (Bristol Section): Annual Business Meeting. 7.30 p.m.	Chemical Department, University, Bristol.
26	Society of Chemical Industry (Glasgow Section): "Causes of Reactivity and Inactivity in Cokes." R. Maclaurin. 7 p.m.	39, Elmbank Crescent, Glasgow.
26	Society of Chemical Industry, Institute of Chemistry (Newcastle Sections) and Newcastle Chemical Industry Club: Annual Dinner. 7.30 p.m.	University Union, College Road, Newcastle.
26	Society of Dyers and Colourists (Manchester Junior Branch): "Recent Developments in Vat Colours." Dr. F. M. Rowe.	Manchester.
30	Hull Chemical and Engineering Society: "Utilisation of Waste Chemical Products." T. Andrews. 7.45 p.m.	Grey Street, Park Street, Hull.

Stream Pollution by Acid Mine Drainage

By R. D. Leitch

The author, who is associate chemical engineer at the Pittsburgh Experiment Station, U.S.A. Bureau of Mines, discusses in this report various methods for the purification of acid water, a problem which, although treated here in its bearing on mines, has wider applications.

THE pollution of streams by acid mine drainage has become of great importance in the past few years in certain regions of the United States. Large quantities of acids are used in and discharged from other industries than mining, notably in tube, sheet, tin-plate, and enamelling works. These are usually less important than coal mines as a source of acid drainage, because of their more limited distribution throughout the States most affected by acid waters and their relatively smaller numbers.

Streams are naturally alkaline and are, therefore, able to take care of rather large quantities of acid wastes, but when such enormous quantities as are often found in mining districts enter the streams, the natural alkalinity is quickly overcome. When a neutral or almost neutral condition has been reached, the further addition of a relatively slight quantity of acids will cause a great difference in the quality of the water.

There are large numbers of other sources of stream pollution, but it seems evident from recent published reports on the subject that damage from acid mine drainage and from sheet and tube-mill wastes causes by far the greatest financial loss at the present time, and presents features that make the problem difficult to solve.

In reporting work done for the United States Engineer Department in 1914, C. M. Young states that the damage to locomotives operated by two railroads in the Pittsburgh district amounts to $1,600 annually for each locomotive, for repairs and replacements directly due to acid waters, exclusive of time lost on the road through leaky boilers. Figures from plumbers at Pittsburgh at that time indicated that the damage to plumbing of residences averaged $10 annually for each house, and aggregated $3,000,000. The damage to industrial plants was of course much greater. In addition to damage to fishing, Major-General Beach estimates the annual damage to Government dams and locks in the Pittsburgh district at $50,000.

Present Methods of Disposal of Acid Water

Use of Limestone.—Few attempts have been or are being made to prevent acid mine waters from entering streams. A few mines have installed some sort of equipment in which the free acid is neutralised by contact with limestone, lime, or marl. As a rule this equipment consists of large boxes which are partly filled with the neutralising agent and have vertical baffles alternately joining at the top and bottom of the box so as to give the water an undulating motion as it flows slowly through the box. A filter bed of coke, cinders, or similar material is provided at the outlet, and the effluent is free from acid and, generally speaking, unobjectionable. More elaborate systems have been installed on the same principle, excepting that settling basins have been provided in which most of the solids in the water are removed.

At one mine iron oxide is recovered and sold for use in gas purification and in the manufacture of certain kinds of paints. During the war the price of iron oxide was sufficiently high to guarantee a fair return on the process, while providing the company with a source of supply of good water used in coke quenching at the mine. It is believed that this is the only instance where any attempt is being made at present to recover saleable by-products from mine drainage waters, and while the company states that the sale by no means pays for the cost of operation, it is more than others have attempted. Drainage from this mine comes from three boreholes and thus is rather easily collected for treatment, but at any other point where the drainage could be collected it might be handled in a similar manner. The use of iron oxide for gas purification and in the manufacture of certain paints is standard practice, and while the market could probably not absorb an unlimited amount of this material, the method works successfully and offers possibilities to a number of other mines.

Use of Barium Salts.—Barium chloride or barium hydrate has been suggested as a precipitating agent, and has been used to some extent where local conditions permitted, but so far the cost is prohibitive. J. W. Ledoux has suggested a scheme whereby the barium sulphate precipitated is recovered and sold as blanc fixe and indicated a profit from the process. Blanc fixe is used in fairly large quantities in different processes in America, but it would seem that a general use of barium compounds for neutralising the enormous quantities of acid mine waters would create such a demand for them that the cost of raw materials would soar to unprecedented height, and the resultant production of blanc fixe would be far more than could be utilised, so that present market prices for this material would drop to almost nothing. However, it is worthy of mention and consideration.

Experience in Other Countries.—The experience of foreign countries, which have long ago had to meet pollution problems in some form or other, offer us no assistance in this particular one. In Europe, for instance, most mines are from 1,000 to 4,000 ft. deep, and, as in Great Britain, they are generally dry, low in pyrite and sulphur, and often in contact with limestone. In France, the chalk deposits overlying most of the coal beds probably prevent the formation of acid waters. G. S. Rice states that in France the coal measures are tight and water does not enter the mines.

Cost of Purification

At first thought it would appear to be fairly simple to treat mine water by some method of neutralisation, but in addition to overcoming the difficulty of first collecting the water for treatment, it must be remembered that neutralising processes generally require large treating and settling tanks, and usually concentrators, evaporators, and filters. When we begin to estimate the enormous quantities of water it would be necessary to handle daily, the problem assumes almost impossible proportions. In addition immense quantities of chemicals, chiefly limestone, would have to be employed, and while these are fairly cheap at present and might always remain so, yet the cost runs into large figures. For Pennyslvania alone, it is estimated that with neutralisation with lime the cost of chemicals would exceed $225,000 per year. Lime is here mentioned as being even cheaper than limestone for general use, on account of the large amount of inert materials necessary to be handled with limestone, although of course limestone is cheaper weight for weight. As such neutralisation would make a very hard water, in most cases unfit for industrial use without softening, the additional cost for softening purposes would be about $750,000 annually. It is difficult to arrive at any significant figures for original cost of installation, upkeep and operation, because no data are available, but installation alone would certainly be not less than $10,000,000 even if duplicate sets need not be built to take care of drainage difficult to collect at one central place. It is conceivable that the increased demand for lime and soda ash would result in a considerably higher price than is quoted at present, in which case the annual cost for chemicals alone is problematical.

G. S. Rice has suggested that the use of limestone for rock-dusting to prevent coal-dust explosions will also have considerable effect in neutralising acid waters within the mine, and this seems to be a very logical conclusion.

Neutralisation of acid mine waters will require an expenditure of large sums of money, but it does not seem to be prohibitive in most cases to treat these wastes to overcome in a large measure present objections to their entrance into streams. Whether this will be an economically sound policy or not will depend upon the collection of more definite data than is available at present. Other than satisfying æsthetic demands, there is no reason for spending more money and effort annually to purify natural waters than the damage amounts to in money and difficulties experienced by users of waters so polluted. The question is, or should be, to decide how much pure waters are worth from all possible viewpoints, and then determine the cost of purification in the same manner. If the one is cheaper than the other, common sense will demand the more favourable.

Some such idea is the basis of the organisation of the Sanitary Water Board of Pennsylvania, and that State seems to have taken a long step in the proper direction by classifying all streams within the State into three general groups: (1) Those so grossly polluted that their cleaning up is impractical or impossible, in which case no restrictions will be placed on wastes dumped into them other than those demanded by common decency or the public health. (2) Those streams that are polluted, but may be gradually restored, in which cases the character of trade wastes is investigated and passed on as individual cases, and those considered harmful must be satisfactorily purified before permission can be obtained to dispose of them by running into this class of stream. (3) Those streams as yet unpolluted and which are to be kept so by keeping out all industrial or municipal wastes in the future.

Properly armed with judicious authority, accurate information and conscientious attention to duty, such a body may solve the problem for the best interest of all. It will take time and money in large amounts, but from the magnitude of the problem at present and its increasing seriousness for the future, even a partial solution will be well worth the cost. Good judgment will have to be used in not burdening industries within one State with large expenditures for purification until other States have established similar regulations, as otherwise, in keen competition with others in industrial markets, the first would be unfairly hampered. While the problem seems to be one for the individual States to solve, no real results may be expected until all affected are working in unison along the same lines and under similar regulations.

Conclusions

1. For mine drainage wastes the only solution is neutralisation by some means. This may or may not result in recovery of saleable by-products.

2. With present-day practice the question of waste disposal resolves itself simply into one of two things: whether it is more economical, everything considered, to treat these wastes at their source, or to bear with the damage done by them later, if untreated. Before a decision can be made, it seems advisable to investigate suggested methods further with the idea of obtaining more accurate data on costs and practicability in general. It is evident that the cost of neutralisation of mine waters would necessarily be added to the cost of the coal to be paid by the consumer.

3. The problem is not one that can be easily solved, and regulations governing disposal are too important and far-reaching in effect to permit of hasty or ill-considered action. Undoubtedly further work should be done as there are no data available except for more or less limited or local conditions.

4. Methods now suggested should be tried if possible at some place where the most difficult conditions are likely to be encountered, in order to determine whether they are practicable.

Canadian Water Power Resources

THE Dominion Water Power and Reclamation Service of the Department of the Interior of Canada has published a new volume of that portion of the series of water resources papers which deals with the surface water supply of Canada. This report is No. 47 of the series, and gives details of stream measurements made in the province of Columbia and the Yukon Territory during the climatic year from October 1, 1923, to September 30, 1924.

The Dominion Water Power and Reclamation Service of the Department of the Interior is engaged in making a systematic survey of the water resources of the whole of the Dominion. For convenience in the administration of a survey covering so great an area, the country is divided into four major districts, whose boundaries are arranged to correspond as far as possible with the water-sheds dividing the great river systems of the northern part of the North American continent, but which must necessarily to some extent be governed by provincial and territorial boundaries. A separate series of stream measurement reports is published for each of these four divisions.

The report under review is one of the fourth series above described. It contains a short explanation of the purpose and scope of the work and 178 pages of tables and descriptions of gauging stations, with an index map of British Columbia showing their location. This report will be supplied free of charge on application to the High Commissioner for Canada, Canadian Building, Trafalgar Square, London, S.W.1, England, or to the Director of the Dominion Water Power and Reclamation Service, Ottawa, Canada.

British Association of Chemists

Disunity

PROFESSOR ARMSTRONG is well known as one who hits hard, and there is no doubt that his address before the Manchester Section of the Institute of Chemistry is one that may well give chemists food for thought. He brands the chemists as being without any instinct for statesmanship, as being intellectually mediocre, without gifts for leadership and without any desire for a leader. Flagellators of the professional conscience—and Professor Armstrong may perhaps be described as a professional Juvenal—are apt to exaggerate, as indeed they must. But it is true that chemists have little sense of statesmanship, and where is their leader to be found? Their disunity is a byword, and it is true that individuals who cannot unite in any circumstances do not as a rule become leaders or produce statesmen.

It is, as Professor Armstrong points out, a scandal that scientific opinion should be ignored where commissions are set up to deal with the problem of coal or that of food. But that this should go on is the fault of the chemist himself, who will not unite for the benefit of himself and that of the community he serves. It is impossible to imagine a commission upon public health upon which the medical profession was not largely represented. Is a coal commission or one that deals with food adulteration, upon which chemists are not largely represented, one whit less ridiculous?

The British Association of Chemists differs from all other societies in that it is interested in all those administrative questions which are not, at any rate to so large an extent, the concern of any other society. The Association does not believe that chemists are without the power or the inclination to unite, but is rather of the opinion that until the formation of the Association no society, however large its membership, possessed the requisite constitution to deal with administrative questions. Having regard to the relative smallness of its membership, the Association has already done more than the most optimistic could have hoped for it. The experience it has gained in eight years of work is extensive and invaluable; experience which an individual can never gain, but which is available for all who will become members of it. With a trebled membership, the Association's influence would be more than trebled, and it is not inconsiderable now; but it is safe to state that Professor Armstrong, despite the blackness of his picture, in the main, is right, and that until chemists begin to look to their administrative affairs, to support the organisation which is best qualified to conduct them, they will remain impotent, inarticulate, and without leaders or statesmen.

H. T. F. RHODES.

The Chemists' Year Book, 1926

THE latest edition of this book, edited by F. W. Atack, D.Sc., F.I.C. (Manchester: Sherratt and Hughes. Pp. 1180. 21s.), has been generally revised, and, in addition, contains a new section on lubricants. Among the many features of the book are tables of physico-chemical constants; tables of the properties of inorganic and organic compounds; articles on general analysis and on the analysis of such diverse products as clays, Portland cement, oils and fats, paints, and pigments, dairy products, brewing materials, leather, gas, etc., and sections discussing crystallography, cellulose and paper, rubber, tobacco, chemical and other scientific journals, chemical invention and the law of patents, the pharmaceutical names of synthetic chemistry, trade names of drugs, and many other subjects. There are various tables of conversion factors, logarithms, etc., for facilitating calculations. The wealth of information contained in this book should make it a useful member of the bookshelf of any chemical laboratory, of whatever type. Moreover, being printed on thin paper, the book, although it contains nearly 1,200 pages, is of small bulk and very easy to handle.

Coal Report and Smoke Problem

To the Editor of THE CHEMICAL AGE.

SIR,—The insistence of the Coal Commission upon research, and more research, into the development of scientific methods for the use of fuel makes it clear that the Commissioners regard the old era of the coal industry as closed. We are no longer to consider that coal mining means finding and digging up stuff that will burn, tossing it into a truck, and letting the consumer do what he likes with it. The treatment of the fuel in such a way as to get out of it the greatest advantage for the community is to be the avowed object of the industry in the dawn that is to follow the darkness of the present depression.

One of the advantages anticipated from the more scientific treatment of the fuel problem is the riddance of smoke, even in great towns. The fact disclosed by the Commission's report that soot discharged into the atmosphere annually represents three days' output of all the mines in the country (employing over a million men) provides a simple but vivid illustration of the waste due to burning raw coal.

After years of research and experiment the way towards freedom from smoke is now pretty clear—smokeless methods in factories and smokeless fuel in domestic use. Hitherto we have always been waiting for something, and at the moment we are waiting for a fuel to take the place of about forty million tons of raw coal burned (in 1923) in domestic grates. Those who know tell us that if we want a smokeless fuel we have got to make it, and making forty million tons of anything is, of course, an industrial undertaking on a vast scale. It can only succeed commercially if the value of the products exceeds the cost of making them. That is, in brief, the position of the question of carbonisation of coal at low temperature. The question has claimed so much attention, as such a system is needed for domestic use in addition to anthracite, coke, gas, and electricity.

At the recent Clean Food Exhibition, Mr. Neville Chamberlain appealed to housewives to supplement the proposed Smoke Abatement Bill and set an example which might be followed by local authorities. Housewives can do much, but not everything, without the help of husbands and landlords. Perhaps, in time, Government itself might realise the possibility of putting its own houses in order. What is now added as an inducement is that the coal industry of the country will be helped towards renewed success by attention to the proper use of fuel; and the use of fuel to make smoke is from now onwards to be regarded as improper.—I am, etc.

March 15, 1926. NAPIER SHAW.

The Study of Fuel Technology

To the Editor of THE CHEMICAL AGE.

SIR,—I have been requested by the Council of the Society of Chemical Industry to place before the readers of your journal certain proposals relating to the establishment of a Fuel Section within the Society.

I would like to point out that for many years it has been the privilege and the function of the Society of Chemical Industry to provide platforms in all parts of the country for the discussion of the scientific and other aspects of fuel technology. A committee which was formed in 1924 undertook the organisation of meetings for this purpose. The original committee consisted of Mr. Garland, Dr. Lander, Dr. E. W. Smith, Mr. Talbot, and myself. The meeting at Leeds in July under the chairmanship of Professor Cobb and Sir Arthur Duckham, and the coke symposium at Sheffield in November under Sir Frederic Nathan are examples of its activities. Special papers on fuel technology are to be presented at the annual meeting of the Society in London this year, and a further symposium upon the subject of coal tar is being arranged for October.

The interest in fuel problems now awakened is indicated, among other things, by the proposed formation of a new Institution of Fuel Technology, which, from its genesis, appears likely to draw its membership largely from the engineering, electrical, and commercial sides, but it is felt that industry in general will continue to look to the Society of Chemical Industry for the development on scientific lines of the principles and practice of fuel technology, which is more than anything else demanded for the better utilisation of the country's fuel resources.

It has, therefore, been decided that the existing Committee, which has already done such valuable work, shall be enlarged and placed in charge of a fuel section which shall be established within the Society and shall be devoted to the development of the application of scientific principles to the study of fuel technology. The section will be open to any member of the Society who pays a registration fee of 5s. per annum, and the committee with its own chairman and secretary has been appointed. The section will take over the work of the joint committee of the Society and other bodies which organised the recent conferences at Leeds and Sheffield, and will do everything possible to strengthen the existing work of the Society in connection with fuel technology. This will be done principally by the organisation of adequate treatment of fuel subjects at the local sections; notices and, wherever possible, an advance copy of all papers upon such matters to be read before any section of the Society will be sent to members of the fuel section. The reports and transactions of the Section will not be published separately as in the case of the Chemical Engineering Group, but the Council of the Society will undertake that all papers upon fuel technology worthy of publication shall have adequate space allowed to them in the *Transactions* of the Society. Further, the abstracts relating to fuel technology will be materially extended.

It is felt that the formation of such a section will co-ordinate the work of chemists and other workers engaged on fuel problems, and will secure widespread and effective discussion of that work. In order to prevent overlapping, and to enable the subject to be dealt with in as comprehensive a manner as possible, it is hoped that co-operation with other institutions by means of joint meetings and in other ways may be arranged.

The members of the committee are Professor W. A. Bone, Professor J. W. Cobb, Mr. E. V. Evans, Mr. G. S. Garland, Dr. Lander, Mr. McCullock, and Mr. W. J. U. Woolcock. The chairman of the section is Professor Arthur Smithells, F.R.S., and the joint honorary secretaries are Dr. E. W. Smith and Mr. H. Talbot, to whom all communications should be addressed at Central House, Finsbury Square, E.C.2.—Yours, etc.,

W. J. U. WOOLCOCK,
President of the Society of Chemical Industry.

March 17.

Chemical Society's Publications Fund

To the Editor of THE CHEMICAL AGE.

SIR,—It is a welcome sign that research work in chemistry emanating from our universities continues steadily to increase. Pessimists told us that the increase which followed the war was due to abnormal conditions and that the apex of the curve would soon be reached. Fortunately for our chemical well-being this is not the case and the curve continues to rise. Unfortunately, the costs of printing do not diminish and the financial burden on publishing societies continues to grow.

In order to ease the burden, the Chemical Society has raised a publications fund which, through the generosity of Fellows and chemical manufacturers, now approaches £5,000; but the income from this is still too small to be really effective. The Society acts as a publishing body for the universities, and does so freely in the interests of chemical science. Nevertheless, it is gratifying to record that one university, namely that of Birmingham, by subscribing £100 from its research fund to the Publications Fund, has recognised the work the Society is doing for it and for academic institutions in general. *Venienti occurrite morbo.*—Yours, etc., JOCELYN THORPE, Treasurer Chemical Society, Burlington House, W.1.

March 13.

Corrosion in Boilers

A STUDY of the mechanism of corrosion and the factors effective in its control in steam power plant operation is being conducted by the U.S. Bureau of Mines at its Pittsburgh experiment station. The purpose of this investigation is to obtain data on the amount of hydrogen concentration that should be maintained in the boiler water in order to reduce corrosion to a negligible proportion. In economiser tubes and feed lines especially, dissolved oxygen in the water causes a great deal of corrosion. Elimination of dissolved oxygen can be partly effected by de-aeration, but this does not wholly remove the oxygen. If the hydroxyl concentration can be controlled to suit the conditions, it can be utilised to control the oxygen.

Chemical Trade Returns for February

Imports and Exports Down on Last Year: Exports Up on January

IMPORTS of chemicals, dyes, drugs and colours (excluding mercury) for February totalled £1,189,788—a decrease of £88,892 on February, 1925, but an increase of £65,325 on January of this year. Exports are valued at £1,954,275, which represents a decrease of £203,437 on February, 1925, but an increase of £34,850 on January of this year.

On the import side, in view of the present prominence of dye manufacture, it is interesting to note that no coal tar intermediates have been imported. While in February, 1925, the figures were only 5 cwt., the year before 155 cwt. were imported. Alizarine also drops from 3,721 cwt. to 164 cwt., and unspecified coal tar dyes are halved at 2,752 cwt. Dyeing extracts also drop from 4,292 to 1,042 cwt. The export figures for coal tar dyes read—1925, 10,162 cwt., 1926, 12,998 cwt.; other dyestuffs, 1925, 4,508 cwt., 1926, 6,391 cwt. There is a remarkable increase in borax imports, from nothing in February, 1925, to 5,582 cwt. last month.

In export figures it will be noticed that the aggregate for sulphate of ammonia is down by some 7,000 tons. France shows no imports as against 566 tons last year, and this state is worthy of notice as a similar condition was pointed out last month. Spain, Italy, and Japan are also down. Benzol and toluol, naphtha, and other coal tar products show marked increases.

In view of the growing importance of the artificial silk industry we have included these figures at the end of both sections this month.

Imports

	Quantities.		Value.	
	1925.	1926.	1925.	1926.
			£	£
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid, Acetic ..... tons	692	695	31,840	30,644
Acid, Tartaric ... cwt.	3,699	2,578	14,718	12,349
Bleaching Materials ,,	12,871	6,715	8,693	5,762
Borax..... ,,	—	5,582	—	7,429
Calcium Carbide.. ,,	78,207	77,106	55,091	51,488
Coal Tar Products, not elsewhere specified .....value	—	—	14,751	62,829
Glycerine, Crude.. cwt.	—	447	—	1,233
Glycerine, Distilled ,,	67	298	255	1,179
Red and Orange Lead ,,	4,074	3,787	8,855	7,804
Nickel Oxide..... ,,	4,184	2,000	20,199	11,335
Potassium Nitrate ,,	15,298	6,309	18,425	8,123
Other Potassium Compounds .. ,,	523,429	353,474	86,201	84,766
Sodium Nitrate .. ,,	157,995	84,127	105,860	54,286
Other Sodium Compounds ..... ,,	22,916	29,342	20,507	20,857
Tartar, Cream of.. ,,	2,720	5,137	10,205	19,071
Zinc Oxide ..... tons	860	1,151	29,984	40,553
All other sorts ...value	—	—	279,543	290,655
DYES AND DYESTUFFS—				
Intermediate Coal Tar Products ..... cwt.	5	—	98	—
Alizarine ..... ,,	3,721	164	19,654	7,776
Indigo, Synthetic. ,,	—	—	—	—
Indigo, Natural .. ,,	33	87	1,000	2,480
Other sorts ..... ,,	5,654	2,542	67,256	52,512
Cutch ..... ,,	4,744	2,752	7,778	5,044
Other Dyeing Extracts cwt.	4,292	1,042	16,668	3,994
Extracts for Tanning ,,	123,632	111,717	130,569	105,815
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground . cwt.	64,053	71,944	14,721	17,105
White Lead (dry) ,,	10,835	10,510	23,702	21,408
All other sorts ... ,,	66,880	84,428	106,214	129,659
Mercury ..... lb.	64,697	125,835	10,560	21,086
Grand Total	—	—	1,289,240	1,210,874
Artificial silk yarn.... lb.	695,146	105,165	204,033	26,215
Artificial silk manufactures ..... value	—	—	272,671	315,993

Exports

	Quantities.		Value.	
	1925.	1926.	1925.	1926.
			£	£
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid, Sulphuric .. cwt.	1,464	9,094	1,907	5,920
Acid, Tartaric ... ,,	808	693	4,234	3,854
Ammonium—				
Chloride ..... tons	267	315	8,022	9,389
Sulphate				
To France..... ,,	566	—	7,835	—
Spain and Canaries . ,,	11,669	4,598	153,170	58,604
Italy ..... ,,	3,923	275	52,053	3,460
Dutch East Indies ... ,,	3,190	4,237	43,419	54,392
Japan ..... ,,	5,036	4,049	63,747	51,762
British West India Islands and British Guiana tons	785	440	10,899	5,901
Other Countries ,,	2,806	6,699	37,292	81,964
Total	27,975	20,298	368,415	256,083
Bleaching Powder .. cwt.	29,863	64,307	15,000	29,101
COAL TAR PRODUCTS—				
Anthracene ..... cwt.	1,978	2,360	.,100	1,103
Benzol and Toluol galls.	2,252	18,565	239	2,687
Carbolic Acid .... cwt.	11,843	13,064	20,477	20,307
Naphtha ..... galls.	5,019	15,684	422	1,485
Naphthalene .... cwt.	2,034	1,770	1,741	1,198
Tar Oil, Creosote Oil, etc. ..... galls.	4,097,259	3,823,610	125,243	118,836
Other sorts ..... cwt.	29,530	22,773	18,901	17,863
Total	—	—	168,123	163,479
Copper, Sulphate of. tons	4,271	4,606	97,990	98,538
Disinfectants, Insecticides, etc. ..... cwt.	35,563	33,155	82,520	75,215
Glycerine Crude ... ,,	13,096	1,872	38,429	5,552
Glycerine, Distilled . ,,	10,172	14,978	38,463	61,829
Total	23,268	16,850	76,892	67,381
Potassium Chromate and Bichromate ..... cwt.	1,479	1,708	3,367	3,208
Potassium Nitrate .. ,,	1,016	927	2,253	1,869
Other Potassium Compounds ..... cwt.	2,732	1,612	13,061	10,636
Total	5,227	4,247	18,681	15,713
Sodium Carbonate .. cwt.	563,138	377,760	139,566	113,461
Sodium Caustic .... ,,	132,234	154,620	101,577	108,815
Sodium Chromate and Bichromate..... ,,	7,260	3,558	12,616	5,354
Sodium Sulphate .. ,,	31,661	22,607	5,069	3,166
Other Sodium Compounds ..... ,,	46,351	51,912	77,926	70,065
Total	780,644	610,457	336,754	300,861
Zinc Oxide ..... tons	178	75	6,524	3,352
All other sorts ..... value	—	—	302,466	247,788
Total (other than Drugs and Dyestuffs).....	—	—	1,487,528	1,276,674
DYES AND DYESTUFFS—				
Products of Coal Tar, cwt.	10,162	12,998	97,691	78,872
Other sorts ..... ,,	4,508	6,391	8,151	8,210
Total	14,670	19,389	105,842	87,082
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground . cwt.	3,610	843	1,743	368
White Lead (dry). ,,	5,884	4,415	15,607	10,107
Paints and Colours, ground in oil or water cwt.	49,040	52,570	114,025	119,499
Paints and Enamels ,,	25,472	31,996	86,390	101,887
All other sorts ,,	45,150	48,568	91,596	97,488
Total	129,156	138,392	309,361	329,349
Grand Total	—	—	2,157,712	1,954,275
Artificial silk yarn.... lb.	607,100	559,416	203,046	165,869
Artificial silk manufactures value	—	—	270,371	485,881

Reviews

INTERMEDIATES FOR DYESTUFFS. By A. Davidson, B.Sc., A.I.C. London: Ernest Benn, Ltd. Pp. 256. 36s.

This book, the latest addition in English to the ever-increasing literature dealing with the dyestuff industry, should prove of interest not only to those already engaged in the manufacture of dyestuffs, but also to those students in our universities and technical colleges who are choosing dyestuffs for their career. The book gives a description of the methods employed in the manufacture of several hundreds of intermediates in a very readable form, and should thus prove of great value to chemists in general who may desire to obtain a mental picture of the dyestuff business. The chemical and physical properties such as melting-point, boiling-point, specific gravity, crystalline form, solubility, etc., are given when known, and in this connection the latest data available are given.

As the author points out in his introduction, there is some difficulty in choosing a suitable arrangement of material in a book of this kind; however, the manner in which the subject is treated probably approaches as near to the ideal as possible; the "method of classification adopted is one which traces the formation, stage by stage, from the coal tar product."

In Chapters I-XIV of the book the various processes involved in the manufacture of dyestuff intermediates are fully described: each of these chapters deals with one parent substance and the products derived from it by the principal operations in dyestuff chemistry, namely by chlorination, nitration, sulphonation, alkali fusion, amidation, oxidation and reduction. Thus in Chapter I the author describes the processes by which monochlorobenzene and *o*- and *p*-dichlorobenzenes are manufactured, and gives the methods for the preparation of numerous derivatives of these. When an intermediate can be made by two or more processes each method is given in its appropriate chapter, and cross-references made to the other methods.

In Chapter XV a short description is given for the preparation of stabilised diazo compounds, and finally in Chapter XVI miscellaneous intermediates derived from the cresols and from carbazole are described. A feature of the book consists in charts showing the relationship of the products to the parent substance and to one another. This should be of great help to the student of dyestuff chemistry. In each chapter full references are given not only to the patent literature, but also to papers in the various journals. Ease in finding any particular process or substance is afforded by two excellent indexes—one of operations and the other a general index.

When dealing with such a complex mass of material as is covered by "Intermediates for Dyestuffs" some of the latter must be omitted if only for the sake of lucidity, and although there are few serious omissions phenyl methyl pyrazolone has assumed such importance as to warrant inclusion in a book of this character. The book is well printed and attractively got up, and shows that revision has been carefully carried out as only one misprint has been noted, namely, on page 14, line 9 from bottom, where "Noelting" is given as "Noteling."

R. S. H.

THE CHEMISTRY OF DRYING OILS. By R. S. Morrell and H. R. Wood. London: Ernest Benn, Ltd. Pp. 224. 21s.

A very readable and useful volume, containing a critical survey of the published literature on the subject under consideration, together with much valuable information culled from the authors' ripe experience and knowledge. It should prove a source of inspiration to all interested in the development of the oil and colour industry. After a brief but instructive and suggestive "Introduction" outlining historic development and future possibilities, Chapter I opens with a general preliminary description of the composition and properties of drying oils *as a class*; this is followed by a full description of the component acids and some of their derivatives, including metallic salts. Chapter 2 contains detailed descriptions of the properties of the various drying oils, including the lesser known oils as well as some of little practical importance. This chapter also contains a summary of the work done on the chemical composition of linseed oil and tung oil. Chapters 1 and 2 overlap to some extent, and it is possible that a rearrangement of the subject matter comprising them might be made with advantage not only to clarity of exposition but also to the question of cost. One notices with regret that this monograph is published at a price considerably in excess of that of other volumes of the series.

In Chapter 3 are described the changes that take place during oxidation of drying oils and of their acid components. Composition is discussed as revealed by a study of oxidation products and rate of absorption of oxygen. The effects on the latter of driers, moisture, light and heat are all referred to, as well as the recent work of Rhodes and his collaborators, in America, on the effect of pigments. A praiseworthy attempt is made to show the true relationship which the changes that take place during oxidation bear to the "drying of an oil"—the latter process being defined as "its power to form an elastic film on exposure"—and the unexplained influence of the glyceryl radicle on the complete process of drying is referred to. This chapter should be read in conjunction with Chapter 8 on "Properties of drying oils from a colloidal standpoint," and it is a pity that the relevant portions of the latter chapter do not appear earlier in the book. This would have again contributed to a curtailment both in size and price, as also would the omission of Chapter 9 on Analysis, which subject, it is understood, is being treated in a separate monograph.

Chapters 4, 5, and 6 refer to methods of expression and extraction of oils from their seeds, the refining and bleaching of linseed oil, and the manufacture and properties of boiled, blown, and stand oils. There is also a very interesting and critical discussion of the changes that take place during the latter processes. Altogether a comprehensive and well-balanced monograph.

H. H. M.

ALLEN'S COMMERCIAL ORGANIC ANALYSIS. Fourth Edition, revised. London: J. and A. Churchill. Pp. 648. 30s.

Since its first appearance "Allen's Commercial Organic Analysis" has become the standard work of reference for organic analytical chemistry in all English-speaking countries, its excellence being due to the fact that numerous chemists who have specialised in definite branches of work have contributed the leading articles. The present volume contains chapters on special characters of essential oils, by E. K. Nelson and G. A. Russell; on the constituents of essential oils and allied substances, their general characters and analysis, and on resins, by E. J. Parry, B.Sc., F.I.C., also a section on india-rubber, gutta percha, balata, and allied substances, by J. B. Tuttle, B.Sc. Many of the analytical methods described have to some extent become standardised by convention, although not yet legally so. The book omits the description of complicated physico-chemical apparatus, most of the space being utilised for the chemical side of the subject. All the information is up to date, and is much superior in broadness, depth, and detail to most continental publications dealing with the same subjects. In short, it is a volume of great value to every chemist connected with these industries.

S. P. S.

VOLATILE SOLVENTS AND THINNERS. By Noël Heaton. London: Ernest Benn, Ltd. Pp. 158. 15s.

This is a useful compilation, bringing together, as it does, in one volume information relating to all the volatile solvents used—to large or small extent—in the manufacture of paints, varnishes, lacquers, polishes, and the like. The solvents are divided into groups and classified according to their chemical nature. About one half of the book is devoted to the consideration of turpentines, petroleum spirits, and the alcohols, and the three chapters dealing with these solvents are probably the best in the book. The remaining solvents, which are treated somewhat briefly, comprise coal tar hydrocarbons (benzol, naphtha, tetralin, and dekalin), ketones (acetone, methyl-ethyl-ketone, and cyclohexanone), ether, esters (the acetates, ethyl carbonate, and ethyl lactate), chlorinated hydrocarbons, and carbon disulphide. The method of treatment is to describe the chemical nature of the solvent, methods of preparation and purification, its physical properties, and an outline of its main uses in the industries mentioned above. A final chapter on "General Observations" contains some useful information regarding methods of testing physical properties for compliance with specification requirements and factory regulations.

H. H. M.

A Text-book of Organic Chemistry. By A. F. Holleman. Edited by A. Jamieson Walker, assisted by Owen E. Mott. Sixth English Edition. London: Chapman and Hall, Ltd. Pp. 581. 17s. 6d.

It is always pleasant to meet an old friend, especially if, while preserving his own individuality, he continues to move with the times. On this account, the publication of a new edition of Professor Holleman's famous book is an event of real importance. A text-book of organic chemistry can be, and often is, an appallingly dull collection of facts. But Holleman has always been in a class of his own. He was one of the first to realisè the importance of physico-chemical methods. When he speaks of steam-distillation, he seizes the opportunity to show how the velocity of distillation of a substance in steam depends on its partial pressure and vapour density and also on the value of these constants for water, clinching the argument by a numerical example relating to nitrobenzene which can be verified by any student in the course of his practical work. An account of the use of a separating-funnel leads to a discussion of the theory of distribution coefficients, and its important bearing on the method of extraction of a substance from solution. Even such superficially dry subjects of discussion as benzoic acid and nicotine are cunningly used to lead the reader to a consideration of the interesting solubility relations of these substances with water. Hence the deserved popularity of the book. It is not merely a vehicle for examination cramming, but a volume which can be read with pleasure for its own sake. It contains sufficient data to make it useful as a small book of reference, but primarily it serves the much more useful purpose of driving home the important moral that organic chemistry consists of something more than the mere accumulation of melting and boiling points.

In this edition the book has been completely rewritten, new work on a number of subjects being incorporated. The general recognition of the value of this book is indicated by the fact that it has gone into forty-three editions in eight languages, while a Czecho-Slovakian edition is now in course of preparation.

Crystalline Form and Chemical Constitution. By A. E. H. Tutton, D.Sc., M.A., F.R.S. With 72 illustrations. London: Macmillan and Co., Ltd. Pp. 252. 10s. 6d.

In giving an account of the present position of chemical crystallography this book fills a gap in current literature. After an initial chapter on the facts of crystallography there are discussions of isomorphism, polymorphism, enantiomorphism and optical activity, liquid crystals, etc. Chemists working in the most diverse fields will find valuable information in the book; as, for example, the work of the X-ray crystallographers on the structure of crystalline quartz and tartaric acid, which is of great significance to the study of stereochemistry, and the very fascinating account of isomorphism and allied matters. Attention is drawn to the manner in which the views developed by crystallographers in regard to the structure of crystals have been substantiated by the work of Sir William Bragg and those who have followed him. The book may be read with profit by all who are interested in chemistry.

General Chemistry. By Horace G. Deming. Second Edition. London: Chapman and Hall, Ltd. Pp. 650. 17s. 6d.

This is described as an elementary survey of the subject. The first section is devoted to the general principles of chemistry. Subsequently the author treats of the periodic classification, the non-metals (including a sketch of the elements of organic chemistry), colloids, and the chemistry of nutrition. The final section is devoted to the metals. Interspersed with these matters are various chapters on physical chemistry, while a short description of modern ideas of the structure of matter is very wisely introduced early in the text. In view of the great advance of synthetic methods, the statement on p. 305 that the "most important source of ammonia and ammonium compounds is coal" seems a little out of date. The author has, however, succeeded in the task which he sets himself in the preface: "Though the course may well begin by being largely descriptive, general principles should receive chief emphasis in the end. . . . The facts of chemistry are but the raw materials from which must be synthesised a certain state and quality of mind."

Second Year College Chemistry. By William H. Chapin. Second Edition. London: Chapman and Hall, Ltd. Pp. 354. 15s.

"The trend of our present day research, in both pure and applied chemistry," says the preface, "implies that principles are much more important than facts and methods." The author's object is to inculcate a knowledge of the general principles of chemistry, and to teach the student to verify and use these quantitatively. There are various chapters on the kinetic theory, the periodic classification, sub-atomic phenomena, the general properties of solution, ionisation, homogeneous and heterogeneous equilibria, electrochemistry, colloids, etc., etc. Each chapter closes with a useful list of exercises, both qualitative and quantitative, which should be of great value to the student. The treatment throughout is clear and logical. According to the author the book serves "as an introduction to physical chemistry, and it causes the student to feel the need of such a course and to look upon it as a logical and necessary step in advance." This claim is more than justified.

Introduction to the Study of Organic Chemistry. By John Wade, D.Sc. New and Enlarged Edition. Revised by Henry Stephen, D.Sc. London: George Allen and Unwin, Ltd. Pp. 646. 8s. 6d.

In this new edition of the late Dr. Wade's well-known book, which has passed through a number of reprints and new editions since its first publication in 1897, opportunity has been taken to bring the subject-matter up to date. A new chapter has been added on derivatives of pyrone, xanthone, and chromone, including an account of the work done in recent years on the natural organic colouring matters. A good feature of the book is an appendix of fifty-six pages of laboratory notes, dealing with the preparation and testing of many substances, which is intended to form a laboratory course in conjunction with the text. The book provides a sound course in very compact form.

Introductory College Chemistry. By Harry N. Holmes. New York: The Macmillan Co. Pp. 500. 14s.

The author has, to a considerable extent, based this book on his earlier publication, *General Chemistry*, and he describes it as a "college text . . . but one specifically planned to meet the needs of the more elementary students." In addition to an extensive account of the elements and their compounds, there are various chapters on organic chemistry, food and nutrition, colloid chemistry, etc. A number of interesting references to industrial processes and applications help the reader to see the relation between science and daily life. The statement on p. 292 that "chemically benzene must be classed as an unsaturated compound" is, as it stands, misleading. The book contains much information in a convenient form.

Volumetric Iodate Methods. By George S. Jamieson, Ph.D. New York: The Chemical Catalog Co., Inc. Pp. 96. 2 dollars.

This work brings together the various procedures and applications of the volumetric iodate methods. Detailed descriptions are given of the determination of antimony, arsenic, copper, mercury, molybdenum, tin, zinc, hydrazine, hydrogen peroxide, sodium thiosulphate, various peroxides, tetrathionates, sulphurous acid, sulphites, dichromates, etc. A bibliography is included. The simplicity and convenience of the method are well known, and as chemist to the Bureau of Chemistry, U.S. Dept. of Agriculture, the author is able to write with the advantage of great experience. The book should be of considerable value to analytical and metallurgical chemists.

Elementary Chemistry. By E. J. Holmyard. London: Edward Arnold and Co. Pp. 424. 5s.

Mr. Holmyard presents his subject so well that even beginners with a prejudice against chemistry will succumb to his blandishments. The book covers the ground required for the various First School Certificate Examinations, but it is so adorned with glimpses of the historical view that it can be read with enjoyment.

Indian Chemical Notes

[From Our Indian Correspondent.]

During the past year, there were considerable extensions in the oil industry and trade in the United Provinces. Existing mills increased their crushing capacity and one new mill was started. There has been a tendency to use improved methods which have resulted in reducing costs of production. Prices for seed, oil, and oilcake were on a considerably higher basis than in the two preceding years. This was particularly noticeable in regard to castor seed and mahua seed and their products. In both cases there was a shortage of seed which appears likely to occur again. In spite of this handicap of high prices, the oil trade of the province continues to thrive. One enterprising firm of oil millers started a soap plant, and from this factory textile soaps of a quality satisfactory to the local trade are being manufactured under the supervision of one of the ex-students of the Government Technological Institute. Throughout the trade, there is still ample scope for improved methods, and it is to be hoped that the trade will rapidly recognise the advantages to be gained by employing technical chemists.

Essential Oils

The condition of the essential oils trade was one of extreme depression and stagnancy. Export of essential oils produced locally was very small because the markets abroad were extremely dull and weak. Prices fell to an extent which made local production unremunerative. The manufacture of perfumery articles, such as attars, etc., was carried on on a more restricted scale, as competition of foreign articles was severer. The industry as a whole seems to be in dire straits. The crux of the whole question is that the province does not produce any essential oil-bearing materials, and unless extensive cultivation of these materials is taken up, there will be no more hope for the once-flourishing industry of the province.

Glass Industry

The Indian glass-works at Firozabad considerably extended their operations and succeeded in making bangles of granite, yellow and ruby-red colour. But the manufacturers at Firozabad are still unable to compete with bangles imported from Austria and Japan which, being pressed in moulds, are still slightly superior in shape and appearance. The services of a skilled workman who can help in the building of better furnaces, and can supervise the making of fire clay pots, are needed, and one of the educated young men from Firozabad could with great advantage to the industry be given one of the proposed short term scholarships for the study of improved methods in foreign countries.

The Paliwal Glass Works of Shikohabad were reorganised during the year under the guidance of a Japanese expert and started manufacturing tumblers, bottles, chimneys, etc. But this branch of the industry, like the one at Firozabad, was carried on under great difficulties and disadvantages owing to the dumping of German and Japanese manufacture and the unfavourable rates of railway freights.

Sugar Industry

A new sugar factory full of promise was started at Hardoi with the assistance of the Department of Agriculture under the name of "The Clarke Central Sugar Factory." The Lucknow Sugar Works, which had received a loan of six lakhs from Government several years ago, worked for a time under the supervision of the Cawnpore Flour Mills of Lala Harkishan Lal. The Aira Factory of the Maha Lakshmi Sugar Corporation, who received a loan of Rs. 1,20,000 during the year, reached the plinth level. Most of the machinery is now on the spot, and the factory is expected to start work in the coming season. There seems to be great scope for the application of the modern established methods of juice extraction and concentration used in large central factories to small scale factories, but 60-ton factories appear to be the smallest unit possible. Research was undertaken at the Technological Institute at the request of a sugar manufacturer on the recovery of sugar from molasses.

Chemicals

The production of saltpetre is reported to have suffered on account of excessive rains, otherwise there was no change in the position of this industry. The Technological Research Laboratory, recently started at Dehra Dun, showed great activity. Research was undertaken at the Technological Institute, Cawnpore, at the request of a firm of distillers, on the manufacture of alcohol from rice waste by the amylo-process. At the request of a manufacturer, work was also undertaken on the production of a cheap newspaper printing ink. The Principal gave advice to a firm of distillers on plant for manufacturing motor spirit from alcohol.

Proposed Tariff Changes

The Government of India are introducing certain important tariff changes. The present duty on cement is an *ad valorem* one of 15 per cent. assessed on a tariff valuation. The price of cement has shown a tendency to fall. The tariff valuation for 1926 has been reduced from Rs. 60 to Rs. 55 per ton, thereby reducing the duty payable from Rs. 9 to Rs. 8·4 a ton. It was clear from the report of the Tariff Board on cement that imported cement could well bear an import duty of Rs. 9 a ton, and in order to stabilise the revenue, it is proposed to substitute a specific duty of Rs. 9 per ton for the existing *ad valorem* duty of 15 per cent.

Printer's Ink

In its report, the Tariff Board, while finding that the case for protection in the printer's ink industry had not been justified, found that the industry was under a disability since the import duty on printer's ink was at a concession rate of 2½ per cent. *ad valorem*, and the duties on the necessary constituents are at a rate of 15 per cent. *ad valorem*. This disability, the Board considers, would be removed if the duty on printer's ink be raised to 5 per cent. The Government of India accept this conclusion and now propose to give effect to it.

Saccharine

Three years ago, the duty on saccharine was raised from 25 per cent. *ad valorem* to a specific rate of Rs. 20 a lb., which was approximately the duty then payable on a quantity of sugar of equivalent sweetening effect. This was, however, an extremely heavy rate on an *ad valorem* basis, and its imposition has served to encourage smuggling rather than increase the revenue or check imports. It is believed that a reduction is needed (*a*) to protect Government revenues, and (*b*) to place the trade on a healthier basis. It is accordingly proposed to reduce the duty to Rs. 5 per lb. Saccharin tabloids are mostly used and on them the specific duty or the ordinary *ad valorem* one on pharmaceutical preparations, whichever is higher, is proposed.

Duty on Sticklac

It is proposed to abolish the import duty of 15 per cent. on sticklac as being a raw material of an important industry. The shellac industry in India is experiencing increased competition in the world's market from synthetic resinous compounds, and from lac derivatives manufactured in America and Germany from sticklac exported from Siam. The effect of the present import duty is to raise still further the cost of lac to Indian manufacturers. When the Indian lac crop is short and when the local crop is plentiful, there are practically no imports and consequently no revenue duty. Therefore it served no useful purpose.

Lubricating Oils

The proposal is to substitute a specific duty of one anna and four pies per gallon for the existing *ad valorem* duty of 7½ per cent. The assessment of duties on these oils on an *ad valorem* basis is a constant source of difficulty and dispute at Customs Houses, owing to the number of grades and varying values of these oils. The difficulty is increased owing to the trade custom whereby direct contracts at special rates are made with large consumers rendering thereby the determination of market values as required by section 30 of the Customs Act a matter of some difficulty. Specific duties would seem to be more appropriate than *ad valorem* rates, and are, in fact, adopted by most countries for these articles. The rate proposed has been determined after careful inquiry so as not to be high on heavier engine oils. For the sake of uniformity, it is proposed also to change the duty on batching oil to a specific one of Rs. 10 per ton. This is exactly the rate at present in force on a tariff valuation basis.

S. G. W.

Oil and Colour Chemists

Papers on Flash Points and Ship Painting

AT a meeting of the Oil and Colour Chemists' Association in London on March 11, Mr. C. A. Klein in the chair, a paper on "Notes on the Flash Point of Paints and Varnishes" was read by J. C. Smith and F. B. Crow.

It was desired to find whether there was a material difference between the flash point of commercial white spirit used in the manufacture of paints and varnishes and that of the paint or varnish containing it, and the influence of composition and viscosity of the paint or varnish on such difference. The samples of commercial white spirit used had flash points 76° F., 80° F., and 95° F., and specific gravity 0·785, 0·788 and 0·792 respectively. Distillations were conducted in the standard Engler flask and flash points were determined by the standard Abel closed test instrument. Many tables were given of the flash points of mixtures of white spirit and raw linseed oil; white spirit and blown linseed oil; white spirit and zinc oxide paints; American turpentine and blown linseed oil; and American turpentine and zinc oxide paints. Difficulties were experienced in attempts to find the effect of barytes and carbon black on the flash point.

Results

It was found that the flash point of a paint or varnish is substantially higher than the flash point of the white spirit or turpentine contained in it, even when the proportion amounts to 25 per cent. by weight, and higher the smaller the proportion of white spirit or turpentine; that the flash point is raised in viscous and highly pigmented mixtures; and that the mean rise in flash point is independent of the flash point of the white spirit. Mixtures containing American turpentine show a remarkable difference in two instances. In the one case, the rise in the flash point of the turpentine mixtures is more than the mean rise of the flash point of similar mixtures containing white spirit, in the other case the reverse occurs.

Mr. R. G. Browning said that from his own experiments he could confirm the authors' fourth conclusion. Replying to various points raised, Mr. J. C. Smith referred to the paper read in 1882 by Professor Abel before the Society of Chemical Industry regarding the difference between what happened in storage and under the conditions of standard tests for comparative results, which was the object of the present paper. At present the authors did not put forward a theory for the results. Mr. Crow said that he thought that the rate of rise of temperature made very little difference to a paint having white spirit in it, as far as flash point was concerned.

Problems in Ship Painting

Mr. Browning read a paper on "Problems in the Painting of Ships." For ship work all paints must be and remain elastic, owing to the frequent expansions and contractions of the metal. It paid to use costly long-oil paints, varnishes and enamels, except in alleyways and cargo runs which were usually repainted more than once a year. For funnels there were used for temperatures of 30–40° C. ordinary oil paint; for 100–150° C., oil and varnish paints greatly thinned, mostly with paraffin. Organic matter began to char at higher temperatures, and he had found only one paint that would retain its pale colour up to about 300° C. Red lead paint with or without white lead appeared to be the current panacea for protecting the network of pipes to be found throughout a ship.

The problem of sweating seemed to be the biggest bugbear of the ship painter and occurred everywhere, most noticeably in bathrooms and on the skin of the vessel. In his opinion it was due to the relative humidity of the atmosphere in the dock, which was usually higher than the normal surrounding air. The practical cures for this sweating were rather more drastic than owners were usually prepared to pay for, but there were methods of treating this condition of affairs. He had found a bitumen paint in emulsion form, water being a disperse phase, and, it was claimed, enabled the paint to adhere thoroughly to damp surfaces.

A permanently elastic paint was the desideratum and bitumen most nearly approached this, but it had the one great drawback of apparently encouraging the growth of a peculiar low form of animal life popularly known as "grass" and found in most salt waters.

Discussion

In the discussion the question of using nitrocellulose lacquers was mooted, but it was stated that they might lack stability and were not elastic enough. The use of rubber and basic lead chromate paints was also touched upon. In regard to sweating it was suggested that if the surface of a ship were made non-conducting (as regards heat) the deposition of moisture could be prevented. In his reply, Mr. Browning said that in funnel paints the pigment was the first consideration. In tests with basic lead pigments linseed oil and tung oil showed no difference in value. Raw oil was useless. Generally speaking, the failure of paint on ships was not due to lack of craftsmanship by the workmen. Spraying of paints instead of brush application saved a certain amount of wastage.

German Potash Industry in 1925

Pre-war and Post-war Prices

THE Deutsche Kali Verein, which celebrated the 20th year of its existence in 1925, has now issued its report for that year. At the outset the report gives a general survey of the potash industry, showing that great progress has been made in the direction of "rationalisation" and concentration of production. The elimination of unproductive installations is stated to have proceeded more smoothly and with less friction than in other branches of industry, the process of exclusion having received great support from the potash economy law.

Under this law, the owners of the potash mines were required to send in, not later than by the end of 1925, declarations as to the unremunerative mines which are to be kept idle until the year 1953. Out of a total of 224 mines or shafts having allotment quotas in the Potash Syndicate, such declarations were received from no fewer than 118. Of the remaining 106 producing mines, a portion will be kept as reserve installations acting for the purpose of equalising the sales during fluctuations in the situation. It is considered that extraordinary economies will be realised by this method of concentration, which has been greatly contributed to by the large loan raised by the potash industry.

Analysis of Sales

The total sales in 1925 are returned at 1,225,511 tons of pure potash, which is not far behind the record year of 1922, when the turnover amounted to 1,290,000 tons. In the case of the exports, which, in pre-war years showed a rising tendency, the quantity of 350,000 tons attained in the past few years has again reached the level of 1909 and 1910, but in 1913 the exports amounted to 500,000 tons, and reached 360,000 tons even in 1914, the average exports in the years of war being 150,000 tons.

Only slight fluctuations have taken place in the industrial consumption of potash salt, in so far as absolute figures are concerned. The quantity reached 70,000 tons in 1924 and represented 7·9 per cent. of the total sales. But, owing to the constantly growing demands of agriculture, the percentage share of industry has considerably fallen off in the course of time; 30 years ago it was still 30 per cent. The demand for concentrated salts at about 80 per cent. has remained at the high level of recent years. The range of prices in 1914 and since April 16, 1925, has been as follows:

Prices Per Double Hundredweight of Pure Potash.

	1914. Marks.	April 16, 1925. Marks.
Carnallite	8·50	7·56
Kainit	10·00	8·97
Potash fertiliser 20 per cent. ..	14·00	12·24
,, ,, 30 ,, ,, ..	14·50	15·64
,, ,, 40 ,, ,, ..	15·50	16·68
Chloride of potash, 50 to 60 per cent.	27·00	27·00
Chloride of potash, over 60 per cent.	29·00	29·00
Sulphate of potash	35·00	31·25
Potash magnesia sulphate	31·00	28·85

Belgium's Production of Radium

World's Chief Source of Supply

THE Belgian Congo has displaced the American West as the world's chief source of radium, Dr. Richard B. Moore, formerly chief chemist of the U.S. Bureau of Mines, says in reporting the results of a survey through the American Chemical Society. The deposits of the Congo are extremely rich, the selected ore now being sent to Belgium averaging nearly 50 per cent. of uranium oxide. On account of the extreme richness of the ore the Belgians have been able to compete favourably with producers dependent upon other sources of supply, with the result that only a relatively small amount of radium is now extracted outside Belgium. Undoubtedly the radium deposits of the Belgian Congo are not only richer but may be expected to provide an even larger amount of radium than the American ores. The extent of the Belgian output is kept secret, but there is at least a possibility of a total production up to date for the whole world of over 300 grams of radium element, although this figure is probably high.

The sulphuric acid method of treatment is used at Oolen in Belgium, where the plant of the Union Minière de Haute Katanga is situated. The process varies from others on account of the high-grade ores treated. Whereas from 300 to 400 tons of carnotite must be treated in order to obtain one gram of radium, at Oolen less than ten tons are required for this amount of radium. This allows a plant arrangement and design which is not possible in other places, the equipment of the plant having been described as being more like a fine kitchen than an actual metallurgical plant. This factory began to produce radium in August, 1922, and from that time until the following January their total production was more than 15 grams of radium element. In the following year it is stated that the production averaged four grams per month. The Belgians are very reluctant to give any detailed information concerning their technical methods of production, and what the total production has been up to date is not known. On the basis of four grams a month it would be possible for them to produce, up to the end of 1924, 110 grams of radium element. It is not believed, however, that so much production has been actually obtained because there has not been a sufficient market for this amount. On the other hand, it is claimed that considerable stocks have been accumulated. Up to the present something like 165 grams of radium have been produced from American carnotites, so that a possible world production of over 300 grams of radium element may be estimated.

Chemistry of the Endocrine Glands

BEFORE a meeting of the Manchester and District Section of the Institute of Chemistry, on March 8, Dr. H. Levinstein presiding, Dr. Meredith Young, Medical Officer of Health to the County of Chester, read a paper on "The Endocrine Glands."

Summarising our present knowledge of the chemistry of the glands of the body, Dr. Young said that insulin was probably "a complex mixture of closely related substances whose composition during the process of precipitation tends to become constant" (Dodds and Dickens). It occurred in almost all the organs of the body, and also in the vegetable world. It contained sulphur linked in an uncertain manner. The chances of its synthesis or preparation as a chemically pure substance seemed to be remote. Its main physiological action was a blood-sugar lowering effect. The thyroid gland invariably contained iodine, the amount of which varied with age, sex, season, conditions of health, locality, diet, etc. From it several different compounds of an organic nature had been isolated, of which thyroxin gave all the reactions of the whole thyroid gland. Physiologically, thyroid gland preparations acted as general stimulators of metabolism. Thyroid deficiency meant that the human iodine factory was not turning out a normal output. The realisation of the vast importance of iodine to the human system had resulted in the iodisation of public water supplies (as in Rochester, U.S.A.), and so on. The parathyroid glands were intimately concerned with the calcium metabolism of the body, and rendered harmless certain toxic substances such as guanidine and its derivatives. Dr. Young also dealt with the metabolic action of ovarian extracts, the pituitary glands in connection with the development of the skeleto-muscular system, and the pineal glandular extract, the use of which was said to postpone senile decay. In a few years' time it would be possible from a few c.c. of blood to make an estimation which would supply the physician with another and a most important aid to diagnosis, prognosis, and treatment. The speaker stated that he prophesied a few years ago that in the sphere of endocrinology the clue to the cancer mystery might be discovered, and he now repeated that prophecy.

Professor Desch on Crystal Growth

ON Tuesday, March 16, Professor C. H. Desch delivered the first of two lectures on "The Growth of Crystals," at the Royal Institution.

The lecturer pointed out that owing to unequal development of faces, two crystals of the same substance, prepared under somewhat different conditions, might differ greatly in appearance, one being, for example, an elongated prism and the other a flat tablet. The presence of small quantities of foreign matter sometimes produced changes in crystalline form; common salt, usually forming cubes, crystallised in octahedra if grown in a solution containing urea. Further, crystals showed a tendency to form branched structures, such as dendrites and radiating growths, of which snow crystals were a good example. Tammann and others had studied the crystallisation of fused substances. When the rate of cooling was slow, smooth rounded crystals were formed, but when heat was withdrawn more rapidly, faces appeared, which developed till the crystal showed the normal form.

The work of Langmuir and others had shown that the first thin film deposited on glass or silica from the impact of a stream of vapour was not crystalline. Probably a unimolecular layer was first formed by a process of adsorption. The molecules having some freedom of movement, rearrangement occurred, giving rise to two-dimensional crystal nuclei. Adsorption played an important part in the growth of crystal faces, and it was this which led to the alteration of the habit of a particular crystal in the presence of impurities. It had been shown that different faces had different adsorbing powers. It was to be expected that the presence of impurity would lower the velocity of growth of the face adsorbing it.

Aggregates of crystals were of importance in metallurgy, petrology and industry. A molten mass began to solidify from a large number of independent centres. Neighbouring crystals met, and the boundaries between the crystals were not crystalline faces, but were determined by the relative positions of the centres of solidification, and the rate of growth, forming polyhedra. Possibly surface tension was concerned in the determination of the shapes of the boundaries between neighbouring crystals.

Pyrometers

ALL kinds of pyrometers are described in the thermo-couple pyrometer catalogue, No. 42, issued by the Foster Instrument Co., Letchworth, Herts. Instruments suitable for superheated or saturated steam, tar products stills, flues, oil tempering baths, hot air mains, lead and aluminium baths, furnaces, general experimental work, and many other purposes are suggested. Usually the pyrometers are of two kinds. In the "Unit" class, used in cases where the installation may be a simple one, the instruments are made with maximum robustness, using standardised interchangeable parts, with requirements as to care in use reduced to a minimum, to secure the greatest simplicity consistent with low cost. The "high resistance" class of pyrometer is for cases where greater flexibility in use is required. Instruments are supplied for temperatures ranging from 0–200° to 0–1300° Centigrade and 0–400° to 0–1400° Fahrenheit. Many examples of industrial applications are illustrated, but the varied nature of requirements renders it impossible to catalogue all the types made to suit special cases, and the makers give special consideration to users' own requirements. Recorders of various types, including those with automatic alarms and controls, are also described. New instruments include a dial pyrometer recorder; a strip pyrometer recorder, giving records on a continuous chart; automatic temperature control apparatus, with "broken-couple" alarm to indicate failure of the thermo-couple; and others. There is an interesting section on the theoretical aspect of pyrometers. The company makes many other kinds of scientific apparatus, electrical, mechanical, thermometrical, etc.

Sulphuric Acid Production in Canada

Mond Nickel Co.'s New Plant

A REPORT from Coniston, Ontario, respecting the new sulphuric acid plant at the smelter of the Mond Nickel Co. states that operations have been proceeding for some time. It is claimed that the plant, which is a distinct innovation in the nickel smelting industry of the Sudbury district, has realised the expectations of its designers and is working most successfully. It is the first attempt made by either nickel company to reclaim the escaping sulphur gases from the converters. The plant includes two units, and the total production will be about 25,000 tons a year. The contact process is used for the manufacture of the acid. The operation is described as follows:

The gas that comes from the converters contains about 6 per cent. impure sulphur dioxide, and is conveyed to the acid plant through a five-foot steel pipe. To clean it it is passed through a large scrubber, and then through a large filter chamber composed of finely crushed coke, which purifies it completely. After leaving the filter chamber, it passes through a series of lead drying towers. In the centre of the building are large electrically operated blowers which act as the heart of the system. The gas is blown by these fans into large converters packed with platinised asbestos. It enters at the top as sulphur dioxide and, owing to the catalysing properties of the platinum, leaves at the bottom as sulphur trioxide.

The gas comes in at about 700° F. and is heated to 1,000° before it leaves, then passing to coolers. From these, it is blown to cast iron absorbing towers, packed with pebbles, entering at the bottom and being forced out at the top, a stream of strong sulphuric acid playing on it all the time. The strong sulphuric absorbs the sulphur trioxide gas, forming an acid much too strong for commercial usage, which is diluted to 66° Beaumé or 93·19 per cent. pure sulphuric acid. From the diluting tanks, the acid is blown by compressed air to the steel storage tanks, and from these it is loaded into the tank cars for rail shipments.

British Chemical Exports to Australia

THE *Report on the Economic and Commercial Situation of Australia* to June, 1925, by Mr. R. W. Dalton (London: H.M. Stationery Office, pp. 60, 2s.), issued by the Department of Overseas Trade, is a remarkably able piece of work, and deserves to be widely known among British manufacturers. The state of affairs regarding finance, industry, imports and exports, transport, etc., is clearly and briefly outlined. Australia is our second largest export market, and it is depressing to read that the share of the United Kingdom in Australia's total imports decreased from 51·9 per cent. in 1922-3 to 45·2 per cent. in 1923-4, while that of the United States increased from 18·8 per cent. to 24·6 per cent. in the same period. The report states that "it is early yet to draw any definite and positive conclusions as to the causes of the decline or the possibilities of its continuance, but it is vitally necessary that British firms should fully appreciate what has already happened in this her second largest export market," though earlier it is stated that "the decline in the share which the United Kingdom secured of the import trade is not due to any relaxation of effort on the part of British firms, but rather to the protection policy of Australia which naturally affects Great Britain's trade more seriously than that of any other country, because Great Britain is Australia's chief supplier and the chief competitor of her own industries."

The Australian Government, however, while anxious to protect Australian industries, shows a desire, for example in the matter of the tariff regulations regarding preference for goods from the United Kingdom, to act in a way which will be beneficial to British trade. The total imports of drugs, chemicals and fertilisers in 1923-4 were valued at £3,878,526. A valuable list is drawn up, in this as in other trades, of cases in which competition with the United Kingdom in goods produced in Great Britain was more or less serious. From this table it appears that the greatest competition comes from the United States. Germany appears in this list in only three cases, including fertilisers (excluding natural fertilisers or superphosphates) of which imports from the United Kingdom amounted to £3,131, and those from Germany to £48,760; and ammonium nitrate, imports of which amounted to £4 from the United Kingdom and £4,226 from Germany. The latter figures are insignificant in amount, but in view of the great activity which is being shown in this country in regard to nitrogen fixation it is possible that they may, in the near future, undergo considerable modification.

Chemical Matters in Parliament

Zinc Concentrate Contracts

Sir B. Chadwick (House of Commons, March 15), in reply to Sir F. Sanderson, said that the Government contract for the purchase of Australian zinc concentrates expired on June 30, 1930. At March 31, 1925, the date of the last completed accounts, the net loss was £1,700,000. The price paid under the contract varied according to market price of spelter, and thus it is not possible to say what would be the total loss on the contract.

Molybdenum Ore Imports

Mr. A. M. Samuel (House of Commons, March 15), in reply to Mr. Harland, said that during 1925 figures were as follows for imports into Great Britain and Northern Ireland from foreign countries—334 cwt. valued at £3,635 was estimated equivalent in terms of 85 per cent. molybdenite, 281 cwt. Corresponding figures for British countries were 367 cwt., £7,215, 277 cwt. Ferro-molybdenum was not separately specified.

Death of Mr. W. R. Cooper

WE regret to announce the death, on Monday, at the age of 58, of Mr. W. R. Cooper, M.A., B.Sc., M.I.E.E., A.M.I.C.E., A.I.C., etc., consulting engineer and editor of *Science Abstracts*. From 1906 to 1919 he was editor of *The Electrician*. He contributed various papers on engineering topics to scientific and technical journals. He served as vice-president, honorary secretary and treasurer of the Physical Society, as vice-president of the Faraday Society, and on the council of the Institution of Electrical Engineers. During the war he was a member of the Advisory Panel of the Ministry of Munitions and of the Nitrogen Products Committee.

Metal Cleaners in Electroplating

THE fourth meeting of the Electroplaters and Depositors Technical Society was held at the Northampton Polytechnic Institute on March 10, under the chairmanship of Mr. D. J. Macnaughton, over sixty members being present. The meeting took the form of a discussion upon "Metal Cleaners in use in Electroplating." The subject was introduced by Mr. E. J. Dobbs of Birmingham, who divided metal cleaners into five classes, and discussed each class, giving their chemistry and cleaning action. An important point made was that pre-war polishing materials were made up mainly with vegetable greases, whereas since the war mineral greases had replaced the vegetable ones. Whilst the vegetable greases could be saponified by means of potash, the mineral greases could not, and so the silico-aluminate type of cleaner had come into use. Examples of chromium plating from Germany and the U.S.A. were exhibited during the meeting. The next meeting will be held at the Institute on April 14, when a paper will be read by Mr. J. S. Sunderland on "Heavy and Rapid Copper Deposition."

Institute of Metals Annual Meeting

AT the annual meeting of the Institute of Metals, he'd in London last week, it was announced that Sir John Dewrance had been elected to succeed Professor T. Turner as president. Sir R. B. Dixon, Sir T. Rose and Mr. W. M. Morrison were the new vice-presidents, and the following were elected to the council: Dr. R. Seligman and Messrs. T. Bolton, H. A. Ruck-Keene, J. Steven, W. G. Turner and H. B. Weeks.

In the report it was stated that while the Institute had developed steadily at home and had received increasing support from the non-ferrous and engineering industries, its position was becoming increasingly international in character.

With the conclusion of the Locarno Agreement German members were beginning once again to resume membership. The present membership, a record one, was 1,747.

Sir J. Dewrance presided at the dinner in the evening and said that the Institute had become the centre of non-ferrous metallurgical thought throughout the world.

Sir Alfred Mond expressed his admiration of the great work of the Institute.

From Week to Week

A BIOGRAPHY OF THE LATE LORD LEVERHULME by his son, the present peer, will be published shortly.

A ZINC WHITE FACTORY with an annual production of 1,750 tons has been erected by the Varnish and Colour Trust and has commenced operations at Yaroslavl, according to Russian reports.

AN APPROPRIATION OF $185,000 for the fiscal year 1927 to continue research at the U.S. Fixed Nitrogen Research Laboratory has been authorised by the Senate as requested by President Coolidge.

THE BRITISH INDUSTRIES FAIR will be held again next year at London and Birmingham, about the same time, by the decision of the Department of Overseas Trade, and the Government grant will be repeated. This year's effort was a marked success.

DR. F. M. ROWE, Manchester College of Technology, well known as editor of the *Colour Index* issued by the Society of Dyers and Colourists, has been appointed to arrange for and supervise the supply of foreign abstracts for the Journal of the Society.

THE PHOSPHORIC ACID, phosphate and other chemical plant of Victors, Ltd., chemical manufacturers, Sutton Oak, St. Helens, has been bought by Thomas W. Ward, Ltd., Sheffield, who have also purchased for dismantling, mining plant of the Westminster Colliery Co. at Wrexham.

SIR ARTHUR KEITH, Hunterian professor in the Royal College of Surgeons, and secretary of the Royal Institution, will be nominated as president of the British Association for the meeting in Leeds in 1927. At the Oxford meeting this year Professor F. O. Bower will preside over the botanical section in place of the late Mr. W. Bateson.

BY THE ROYAL CHARTER of Incorporation recently obtained by the Textile Institute, powers were given to award Diplomas of Fellowship of the Institute (F.T.I.). In recognition of his great services in connection with the Charter, the first Certificate of Fellowship and an address, have been presented to Mr. John Emsley, President of the Institute.

THE INSTITUTION OF CHEMICAL ENGINEERS announce that the examinations for associate-membership will be held in June and July next. Particulars and the memorandum on "The Training of a Chemical Engineer" may be obtained on application to Mr. C. S. Garland, The Institution of Chemical Engineers, Abbey House, Westminster, London, S.W.1.

A GRANT OF £250 has been made by the Society of Dyers and Colourists to Dr. Schultz to record their appreciation of his work, *Farbstofftabellen*, which has been of great assistance in the compilation of the *Colour Index*. An agreement has been made whereby the Society has the right to use present and future editions of the *Farbstofftabellen*, and Dr. Schultz receives the same rights with regard to the *Colour Index*.

THE SALT UNION'S works at Malkins Bank, Sandbach, have been closed, preparatory to being demolished, after 100 years. This closure ends the Union's long connection with the Sandbach area where they formerly had four separate works. The Union has other more modern installations where salt can be marketed more cheaply. Three companies have opened up at Elton, Sandbach, and large quantities of salt are being made both for home and export.

THE RAMSAY MEMORIAL TRUSTEES will at the end of June consider applications for two Ramsay Memorial Fellowships for Chemical Research. One will be limited to candidates educated in Glasgow. The value of the Fellowships will be £250 per annum, to which may be added a grant for expenses not exceeding £50 per annum. Full particulars as to the conditions are obtainable from Dr. Walter Seton, Secretary, Ramsay Memorial Fellowships Trust, University College, Gower Street, London, W.C.1.

A MEETING OF THE CREDITORS of G. Anderton, Sons and Co., Ltd., paint and varnish manufacturers, Park Works, 252, Chapel Street, Salford, Lancs, in voluntary liquidation, was held recently at Manchester. A statement of affairs disclosed liabilities of £3,288 9s. 5d., and assets estimated to realise £1,850 10s., from which had to be deducted £26 for preferential claims, leaving net assets of £1,824 10s., or a deficiency as regards the creditors of £1,463 19s. 5d. The company had suffered heavily through bad debts. Creditors passed a resolution confirming the voluntary liquidation, with Mr. Craven as liquidator.

IN THE COMPULSORY LIQUIDATION of The Vauxhall Chemical Co., Ltd., 161a, Upper Kennington Lane, London, incorporated on June 24 last and promoted by Louis Frederick Ducker to acquire the business of manufacturers, merchants and contractors of all kinds of chemicals and chemical compounds, the Official Receiver has now issued a statement. This discloses liabilities £2,056, estimated net assets £412, a deficiency of £1,644 with regard to creditors and a total deficiency of £2,644 in relation to shareholders. Ducker was appointed managing director but left the country. The failure was attributed to inability to find a market for certain battery products. The liquidation remains in the hands of the Official Receiver.

THREE DIRECTORS, Sir James Dunn, Mr. Thomas Rowe, and Mr. C. Christie, have resigned their seats on the board of the Cellulose Holdings and Investment Co., Ltd.

THE ACCUMULATION OF CARBONIC ACID GAS is now stated by the High Commissioner for New Zealand to have been the cause of the collapse of two ship's officers at Liverpool last week. A cargo of cheese produced the gas.

THE BRITISH ALIZARINE CO., LTD., have entrusted their selling arrangements in Scotland to Henderson, Hogg and Co., one of the oldest firms in the industry. They have recently enlarged their premises at 17, Cadogan Street, Glasgow.

SIR ALFRED MOND, speaking at Newcastle on Monday, said that good will and co-operation alone could recapture trade for coal—an industry that had been saturated by politics. With maximum endeavour neither hours nor wages need be altered.

THE APPEAL of Mr. J. B. S. Haldane, which was heard in private at the Law Courts on Wednesday against the finding of the Sex Viri depriving him of the Readership in Biochemistry at the University of Cambridge on the ground that he was co-respondent in a recent divorce suit, was allowed. From this decision there is no appeal.

SIR F. G. HOPKINS, the recognised founder of the school of biochemistry in England, presided at the dinner held in London on Saturday, March 13, to mark the hundredth meeting of the Society. Mr. J. H. Gardner said that the society was founded in 1911 because of indignation felt at the proposal to import an Austrian to teach British workers how to apply chemistry to living tissues.

IN THE CHANCERY DIVISION on Tuesday Mr. Justice Eve sanctioned a petition to confirm the alteration of the objects of the National Sulphuric Acid Association, Ltd. The alteration proposed gave the Association power to acquire sulphuric acid. The company was limited by guarantee and had no share capital. It was not distributing profits. It was a body of traders bound for a common object.

PROFESSOR THOMAS TURNER, M.Sc., F.I.C., Dean of the Faculty of Science, Birmingham University, and Head of the Metallurgical Department, will, in July next, be relinquishing that position under the age limit. Professor Turner was the recipient of the Bessemer Gold Medal in 1925 and has held the Metallurgical Professorship at Birmingham since the foundation of the Chair in 1902. He has contributed much to the technical press.

TWO TRADE FIRES are reported. Damage estimated at £35,000 was caused by fire at the wholesale chemical and drug warehouse of John Mackay and Co., Canning Street Lane, Edinburgh. The building was completely destroyed and an aerated water factory belonging to the company was badly damaged.—A serious outbreak occurred on Sunday at the works of the Blackburn Products Co., tallow refiners, Blackburn.

IN THE BOW COUNTY COURT, on Monday, before Judge Hargreaves, H. Handy, of 9, St. Anne's Road, Barking, E., sought to recover £200 under the Workmen's Compensation Act from Hemingway and Co., Ltd., colour and chemical manufacturers, of 28, Marshgate Lane, Stratford, E., in respect of an accident to him on February 13, 1924, when in their employ. After hearing medical evidence on both sides, the judge found for the respondents with costs.

MR. R. J. MARX, consulting paper mill engineer, of Finsbury Pavement, E.C., and a member of the Institution of Chemical Engineers, in the King's Bench Court, on Wednesday, March 10, sued the Graphite Oil Co., Ltd., of Grimsby, in respect of professional fees. Mr. Marx was asked by the company to advise as to the making of a roofing felt from their material. He worked for a considerable time on the problem, and submitted sketches of appliances for successful operation on a small scale. Professor J. W. Hinchley attended on behalf of the Institution, and Mr. Marx was awarded a complete verdict.

AT THE INQUEST on the death of R. H. Goffe, an electric meter repairer, at Erdington, on Wednesday, it was stated that though working with mercury the man need never have had any on his hands. An abnormal quantity of mercury was found in certain organs, and the man had suffered from chronic mercurial poisoning prior to death. Reference was made in evidence to a former method of cleaning mercury with nitric acid. It was stated that susceptibility to lead or mercurial poisoning varied with the individual. Some men could not touch lead without developing poisoning, others worked with it for a lifetime.

Obituary

MR. W. R. COOPER (see p. 275).

MR. J. W. BENTLEY, Horsforth, Leeds, soap manufacturer, aged 76.

MR. J. A. RADFORD, a secretary, and for several years president of the Midland Pharmaceutical Society, aged 72.

MR. J. ROSSITER HOYLE, a past Master Cutler and a Director, of Thomas Firth and Sons, Ltd., in London, aged 68.

MR. J. CROMBIE, of J. Crombie and Sons, Middlesbrough, for 40 years associated with the concrete industry and a pioneer in the slag concrete trade on Tees-side, aged 64.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each

Abstracts of Complete Specifications

247,978. ALUMINOUS MATERIALS, TREATMENT OF. H. Spence and W. B. Llewellyn, and Peter Spence and Sons, Ltd., Manchester Alum Works, Holland Street, Manchester. Application dates, August 6 and September 18, 1924.

Aluminium sulphate can be made from hard aluminous minerals such as shale, silicious bauxite, fireclays, clays, etc., by circulating sulphuric acid through the minerals in the form of lumps, if sufficient silicate is present to prevent disintegration. If the aluminous material is naturally in a disintegrated condition, the treatment with acid is more difficult and a considerable proportion of the alumina may remain undissolved. In this invention, aluminous materials in disintegrated form are used, and are converted into the form of permeable silicious lumps which are resistant to disintegration by acids. The aluminous material may be used alone if it is naturally sufficiently plastic and contains sufficient silica, or it may be mixed with a suitable proportion of plastic clay, sodium silicate, or other binding agent. The mixture is formed into lumps and calcined at a dull red heat. The product may be reduced to smaller lumps, and is permeable but sufficiently resistant to disintegration by acids. Reference is directed in pursuance of Section 7, Sub-section 4, of the Patents and Designs Acts of 1907 and 1919, to Specifications Nos. 119,924 and 112,881.

247,241. ACTIVE CARBON, MANUFACTURE AND USE OF. J. N. A. Sauer, 2, Den Texstraat, Amsterdam, Holland. Application date, August 13, 1924.

This active carbon is particularly suitable for the adsorption of gases and vapours, and is sufficiently hard to withstand mechanical disintegration. The carbon in the form of small particles is coated or impregnated with a substantial amount of supplementary active carbon or inorganic adsorptive material. The starting material may be a gas-activated carbon made from a relatively porous material such as pine or willow wood, which usually has a low apparent specific gravity, and the final product has a materially higher specific gravity. The supplementary adsorptive material may be silica gel or other adsorptive oxides such as alumina or iron oxide, or phosphates. The activated carbon may be impregnated with a dilute solution of sodium silicate, and then treated with an acid to precipitate hydrated silicic acid, or *vice versa*. The material is then dried at a low temperature and subjected to further activation by gas.

The supplementary material may be active carbon, which is introduced by impregnating the starting material with an organic material such as solution of starch, dextrine, glucose, sugar, protein, gelatine, gum, sulphite lye. These substances are then converted into activated carbon by means of heat and activating gases or liquids. The product may be employed for charging cylinders for gas storage, or removing colouring matters, or drying air, or separating benzene from coal gas, etc. The added substance may be such as to evolve gas on heating, so as to form a porous product. The product is substantially harder and of higher specific gravity, and is little less active than the initial carbon material.

247,261. VAT COLOURING MATTERS, MANUFACTURE OF. J. Y. Johnson, London. From Badische Anilin and Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, November 6, 1924.

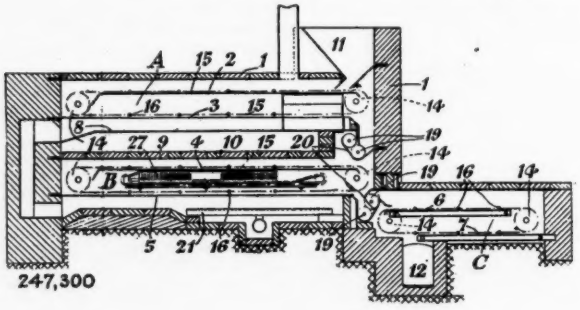
Isodibenzanthrone can be obtained directly from benzanthrone by treating with alkali alcoholate so as to make the formation of dyestuff complete. An alkali metal hydroxide and an indifferent diluent are preferably added, and the product is a mixture of isodibenzanthrone and dibenzanthrone in proportions depending on the temperature and the kind of alcohol used. The mixture can be separated after purification by treating with alkali hydrosulphite, in which the dibenzanthrone is more readily soluble. In this process, 2 : 2^1–dibenzanthronyl may be used instead of benzanthrone. In an example, benzanthrone is added to a molten mixture of methanol and caustic potash at 170° to 180° C. and the mixture separated as described above. Other examples are given in which benzanthrone is first converted into 2 : 2^1–dibenzanthronyl, and also in which butyl alcohol and isopropyl alcohol are used.

247,250. ACRIDINE DERIVATIVES AND THEIR SOLUTIONS, PROCESS FOR THE PRODUCTION OF. C. Schnorf, 4, Bergstrasse, Zurich, and F. Hefti, Altstetten, near Zurich, Switzerland. Application date, October 14, 1924.

Substances of the type of 2-ethoxy-6 : 9-diamino-acridine hydrochloride have the disadvantage that their solutions must be freshly prepared before use, and that only dilute solutions can sometimes be obtained. In this invention, easily soluble solutions can be obtained by acting on a 9-amino-acridine derivative or its salts with a carbo-hydrate or mixture of carbohydrates. The resulting compound is dissolved in water, and substances such as glycerine, common salt, hydrochloric acid, etc., may be added without affecting the solubility or stability. Examples are given of the treatment of 2-ethyloxy-6 : 9-diamino-acridine hydrochloride and galactose, and the purification of the product. The product is used for therapeutic purposes.

247,300. CARBONACEOUS MATERIALS, DISTILLATION OF. E. M. Salerni, 19, Rue Auber, Paris. Application date, November 14, 1924.

This apparatus provides separate chambers for drying and distilling carbonaceous material, of the kind in which material is conveyed over superposed horizontal plates by means of endless chain conveyors. The illustration shows an apparatus



for the low-temperature distillation of carbonaceous material. A casing 1 contains superposed shelves 2, 3, 4, 5, 6, 7. The drying portion A is separated from the distilling portion B by partitions 8, 9, the latter having a firebrick lining 10. The material is fed through a hopper 11, and the coke is cooled in a cooler C and discharged at 12. The endless chains 15 are provided with bars 16 and pass over chain wheels 14. A roller feed device 19 is provided to transfer the material from one section to the other, and plates 20 provide a seal for the volatile constituents. Heating burners 21 are provided in the chamber B, and the shelves 6, 7 may be water-cooled. The distillation products are drawn off from the chamber B through a dust extractor 27.

247,378. SULPHIDE DYESTUFFS, MANUFACTURE OF. A. G. Bloxam, London. From Akt.-Ges. für Anilin-Fabrikation, Berlin-Treptow, Germany. Application date, February 10, 1925.

These dyestuffs are produced by melting together sulphur or a compound which yields sulphur, except alkali sulphides and polysulphides, and a leuco-indophenol in which the hydrogen of the amino group has been exchanged for the methylene—or benzylidine—group. Other derivatives of leuco-indophenols may be used, which have a tendency to undergo thiazole ring closure during sulphiding, such as benzyl derivatives, acyl derivatives of the aliphatic or aromatic series, or substitution derivatives.

In an example, 4-amino-4^1-oxydiphenylamine is mixed

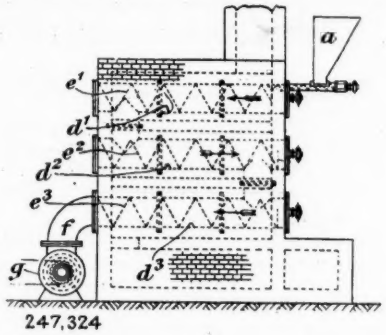
(*Continued on p. 279*)

(*Continued from p.* 278)

with benzaldehyde, yielding the benzylidine compound, and sulphur is then added and the mixture heated to 200° C. for ten hours. The product is dissolved in aqueous sodium disulphide solution and air passed through it to precipitate the dyestuff. In an alkali sulphide bath it gives red-brown shades on cotton which have a good fastness to chlorine. The benzaldehyde may be replaced by benzoyl chloride or acetic anhydride.

247,324. DISTILLATION OF LIGNITES. E. Heneage, 27, Elvaston Place, Queen's Gate, London, S.W.7. Application date, November 28, 1924.

Lignite is fed through a hopper *a* to the uppermost of three horizontal cylinders d^1, d^2, d^3. Each cylinder is provided with a screw conveyor e^1, e^2, e^3, to move the material through



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the cylinders alternately in opposite directions. Each cylinder is connected to the one below at opposite ends alternately, and the material finally passes through a pipe *f* to a cooler *g*. Heating gases pass upwards over the cylinders. The conveyors e^1, e^2, e^3 are flanged, and the flanges are in contact with the cylinder walls, so that heat is conducted into the material.

247,405. POTASSIUM SALTS, PROCESS FOR THE PRODUCTION OF. E. Niccoli, Ufficis Studii Giacimenti Saliferi di Bu-Kammasch, Tripoli. Application date, March 6, 1925.

Potassium salts are obtained from sea water, which contains an average of 500 gms. of potassium chloride per cubic metre. Sea water is evaporated to 34° Bé, and the deposited sodium chloride and magnesium sulphate removed. The liquor is then evaporated to 36° Bé to deposit potassium-magnesium sulphate. This salt, which contains some sodium chloride, magnesium sulphate, potassium magnesium chloride, potassium sulphate, and sodium bromide, is dissolved in water, and mixed with magnesium sulphate and evaporated. The double salt K_2SO_4, $MgSO_4$, $6H_2O$ is obtained, and is dissolved and treated with the necessary quantity of lime, which precipitates magnesium hydroxide, leaving potassium sulphate of 97-98 per cent. purity. The yield is about 96 per cent. Sodium or potassium carbonate may be employed instead of lime.

247,439. ALKALI METAL SILICATES SOLUBLE IN WATER. PROCESS FOR THE PRODUCTION OF. B. E. D. Kilburn, London. From Norsk Hydro-Elektrisk Kvaelstofaktieselskab, 7, Solligaten, Oslo, Norway. Application date, May 16, 1925.

Water glass is produced on a commercial scale by mixing hydrated silicic acid with any compound of an alkali, oxygen, and nitrogen, and heating the mixture to a temperature below melting point. The silicic acid may be obtained by treating natural silicates with nitric acid, and the added compound may be nitrate or nitrite, or the mixture obtained by absorbing nitrous gases in alkaline solutions. The maximum temperature should be 600°–700° C. The silicic acid may alternatively be obtained by treating with nitric acid a silicate which is partly soluble, extracting alkali nitrate, and mixing this with the undissolved silicic acid and heating. The nitrous gases evolved may be converted into nitric acid and used for treating more silicate.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 225,833 (Naamlooze Vennootschap Handelmaatschappij Grikro), relating to manufacture of zinc oxide, see Vol. XII, p. 138; 226,822 (Soc. Anon. des Distilleries des Deux-Sèvres), relating to a continuous process for the dehydration of volatile fatty acids, see Vol. XII, p. 232; 232,206-7 (H. Staudinger), relating to derivatives of 4-oxypiperidine, see Vol. XII, p. 616; 232,909 (Naugatuck Chemical Co.), relating to manufacture of styrol and its homologues, see Vol. XIII, p. 18; 239,502 (Soc. Anon. d'Ougree-Marihaye), relating to fractional distillation and condensation of complex mixtures, see Vol. XIII, p. 477.

International Specifications not yet Accepted

245,765. DYES. I. G. Farbenindustrie Akt.-Ges., Leverkusen, near Cologne, Germany. Assignees of Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. International Convention date, January 8, 1925.

Diazo compounds are coupled with the methyl pyrazolones or pyrazolone carboxylic acids obtained from aminodiarylsulphones and their derivatives such as sulphonic acids, carboxylic acids, or oxy-carboxylic acids. When pyrazolones containing the *o*-oxycarboxylic acid grouping are used, the dyestuffs can be used as chrome dyestuffs for wool, giving yellow-red shades. Diazo components mentioned include *o*-toluidine, *o*- or *p*-sulphanilic acid, 4-chlor-2-nitraniline, 4-chlor-2-aminophenol, 4′-methyl-2-amino-diphenyl-sulphone and its 4-sulphonic acid. Coupling components include methyl pyrazolones and pyrazolone carboxylic acids from 4′-methyl-2-amino-diphenyl-sulphone and its 4-sulphonic acid, 4′-methyl-4-amino-diphenyl-sulphone-2-sulphonic acid, and 4′-oxy-3′-carboxy-2′-aminodiphenyl-sulphone-4-sulphonic acid.

4′-methyl-2-aminodiphenyl-sulphonic is obtained by condensing *p*-toluene-sulphinic acid with 2-nitro-1-chlorbenzene, 4′-methyl-4-aminodiphenyl-sulphone-2-sulphonic acid is obtained by condensing *p*-toluene-sulphinic acid with 4-nitro-1-chlorbenzene-2-sulphonic acid and reducing; 4′-oxy-3′-carboxy-2-aminodiphenyl-sulphone-4-sulphonic acid is obtained by condensing salicyl-sulphinic acid with 2-nitro-1-chlorbenzene-4-sulphonic acid and reducing. Pyrazolones are obtained by condensing the hydrazines from aminodiarylsulphones with acetoacetic or oxaloacetic ester.

245,790. DYEING CELLULOSE ESTERS AND ETHERS. I. G. Farbenindustrie, Akt.-Ges., Hoechst-on-Main, Germany. Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, January 9, 1925.

Monoazo dyestuffs are used containing as coupling component an *o*-aminophenol ether or a monoacyl-*m*-phenylenediamine or a homologue or substitution product, and the dyeings can be diazotised and developed. Dyestuffs mentioned include 2-chloraniline-5-sulphonic acid → 3-amino-4-cresol methyl ether, deep yellow; 4-nitraniline-3-sulphonic acid → 3-amino-4-cresol-methyl ether, orange; nitro-*p*-phenylene diamine → 3-amino-4-cresol-methyl-ether, orange; *m*-aminoacetanilide coupled with the diazo compounds of 2-chloraniline-5-sulphonic acid, 3-nitraniline-4-sulphonic acid and *m*-nitraniline, yellow to orange.

LATEST NOTIFICATIONS.

248,726. Process for the purification of condensation products produced from phenols and aldehydes. Bakelite Ges. March 6, 1925.

248,729. Manufacture of condensation products of urea or its derivatives and aldehydes. Pollak, F. March 3, 1925.

248,738. Processes for the manufacture of pure hydrochloric acid. Verein für Chemische und Metallurgische Produktion. March 9, 1925.

248,759. Manufacture of new anthraquinone compounds. I. G. Farbenindustrie Akt.-Ges. March 3, 1925.

248,766. Manufacture of azo dyestuffs. I. G. Farbenindustrie Akt.-Ges. March 5, 1925.

248,767. Manufacture of coloured dressings for leather. I. G. Farbenindustrie Akt.-Ges. March 6, 1925.

248,781. Process for the production of moulded pieces from dry mixtures of cellulose derivatives and albuminous substances. Schmidt, Dr. F. March 6, 1925.

248,782. Manufacture of water-soluble condensation products. I. G. Farbenindustrie Akt.-Ges. March 9, 1925.

248,791. Manufacture of α-keto-β-naphthols and of condensation products of the benzanthrone series. I. G. Farbenindustrie Akt.-Ges. March 9, 1925.

Specifications Accepted with Date of Application

232,251. Azo-dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. April 9, 1924. Addition to 211,223.

232,618. Pigments containing zinc oxide, Manufacture of. P. Pipereaut and A. Helbronner. April 18, 1924.

235,589. Resinous condensation products and method of preparation. British Thomson-Houston Co., Ltd. June 13, 1924.

239,841. Tar and like substances, Method and apparatus for the continuous distillation of—and for the continuous rectifying of their by-products. C. Ab-der-Halden. September 13, 1924.

244,697. Light hydrocarbons, Process for the production of. Allgemeine Ges. fur Chemische Industrie. December 19, 1924.

247,787. Dyes and dyeing. J. Morton, J. I. M. Jones, B. Wylam, J. E. G. Harris, J. Wilson, and Morton Sundour Fabrics, Ltd. August 11, 1924.

248,070. Base exchange materials and process of making same. H. J. C. Forrester. (*International Filter Co.*) November 26, 1924.

248,077. Carbonisation of coal, and appatratus for use therein. Illingworth Carbonisation Co., Ltd., and S. R. Illingworth. November 27, 1924.

248,079. Rotary kilns for burning cement, ore, and similar materials. Vickers, Ltd., and L. D. Parker. November 27, 1924.

248,081. Recovery of the solid constituents of liquids containing them. Process of and apparatus for use in. H. N. McLeod. November 28, 1924.

248,115. Cracking of liquid hydrocarbons. V. L. Oil Processes, Ltd., O. D. Lucas and E. L. Lomax. December 9, 1924.

248,182. Acridine derivatives, Manufacture of. British Dyestuffs Corporation, Ltd., W. H. Perkin, and A. W. Burger. March 12, 1925.

248,186. Fractional distillation of hydrocarbons, Process of and means for. C. de Ganahl and F. C. Koch. March 16, 1925.

248,214. Iron perchloride, Manufacture of. D. Tyrer. May 6, 1925.

248,230. Trisazo dyestuffs, Process for the manufacture of. W. Carpmael (*Farbenfabriken vorm. F. Bayer and Co.*). May 29, 1925.

248,246. New cellulose compounds, Manufacture of. L. Lilienfeld. May 30, 1925. Addition to 231,801.

Applications for Patents

American Cellulose and Chemical Manufacturing Co., Ltd., and British Celanese, Ltd. Treatment of fabrics, etc. 6,914. March 12.

Barnard, C. M., and British Alizarine Co. Dyeing cellulose-ester artificial silks. 6,895. March 12. (November 15, 1924.)

Beghin, P., British Alizarine Co., Ltd., and Dawson, W. H. Manufacture and purification of violanthrone. 6,509. March 9.

Bull, P. C., and Spencer, D. A. Production of white synthetic resins. 6,698. March 10.

Chemische Fabrik auf Actien, vorm. E. Schering. Manufacture of solid products containing nicotine. 6,846. March 11. (Germany, March 14, 1925.)

Chemische Fabrik auf Actien, vorm. E. Schering. Manufacture of esters of isoborneol, etc. 6,926. March 12. (Germany, April 11, 1925.)

Chemische Fabrik auf Actien, vorm. E. Schering. Treating formic acid. 6,927. March 12. (Germany, April 6, 1925.)

Chemische Fabrik Ges., Oehme, H., and Potts, H. E. Manufacture of glycols. 6,768. March 11.

General Fuel Briquette Corporation. Briquetting-presses. 6,430. March 8. (United States, April 8, 1925.)

Grasselli Chemical Co., Aldehyde-amine condensation products, etc. 6,451. March 8. (United States, March 13, 1925.)

Henshaw, D. M. Condensers for recovery of by-products from carbonisation of coal, etc. 6,811. March 11.

I. G. Farbenindustrie Akt.-Ges., and Imray, O. Y. Manufacture of azo dyestuffs. 6,618. March 9.

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Cleaning, wetting, emulsifying, etc. 6,720. March 10.

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of organic compounds. 7,051. March 13.

I. G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of aromatic derivatives of formamide. 7,052. March 13.

I. G. Farbenindustrie Akt.-Ges. Manufacture of organic compounds from natural oil, etc. 6,435. March 8. (Germany, March 19, 1925.)

I. G. Farbenindustrie Akt.-Ges. Process for treating cellulose derivatives. 6,457. March 8. (Germany, May 20, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of water-soluble condensation products. 6,458. March 8. (Germany, March 9, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of α-keto-β-naphthols etc. 6,615. March 9. (Germany, March 9, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of halogen-dibenzpyrenequinones. 6,920. March 12. (Germany, March 14, 1925.)

I. G. Farbenindustrie Akt.-Ges. Production of liquid organic compounds. 7,053, 7,054. March 13. (Germany, March 14, 1925.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of dyestuffs of the triaryl-methane series. 7,071. March 13. (Germany, March 14, 1925.)

Krantz, H., (Firm of), and Mond, A. L. Preparation of bobbins for dyeing, etc. 6,853. March 12.

Litharge Recovery Corporation. Treatment of hydrocarbon oils. 6,417. March 8. (United States, December 26, 1925.)

Metallbank und Metallurgische Ges. Akt.-Ges., and Mond, A. L. Recovery of volatile solvents. 6,558. March 9.

Murray, H. D. Production of white synthetic resins. 6,698. March 10.

Mycock, W. Dye jigs. 6,514. March 9.

Oppé, A. Manufacture of mixtures of alkali hypochlorite and alkali chloride in solid form. 6,905. March 12. (Germany, March 23, 1925.)

Schultz, E. Recovery and conversion of light oil from crude oil, etc. 6,629. March 9.

Smith, H. G., Smith, P. A., and Synthetic Ammonia and Nitrates, Ltd. Manufacture of acetic acid and acetates. 6,976. March 13.

Smith, H. G. Production of acid amines and salts. 6,977. March 13.

Stern, E. Processes for making starch products. 6,346. March 8.

Threlfall, R. Manufacture of carbon disulphide. 7,074. March 13.

Electrical Gas Purification

THE *Chemiker-Zeitung* (February 3, 1926) contains a discussion of recent German developments in the removal of dusts from gases by the Cottrell-Möller method of electrical precipitation (or electro-filtration). In the lignite-briquette industry the hot vapour from the drying apparatus contains much solid matter, which is removed by an electrical precipitator built into the flue, and converted into briquettes, the amount of the latter thus obtained being 7·5 per cent. of the whole output. The dust nuisance, previously very severe in the neighbourhood of these factories, is completely obviated. The method finds further application in the preparation of gases (illuminating, etc.), coal tar, shale oil, etc. In general, the gas from the generator, at a temperature above the condensation-point of the tar contained in it, is passed through an electrical precipitator, which removes the solids. The gas is then cooled to a point below the condensation-point of the tar, or oil, but above the dew-point, and passed through a second precipitator, by which means practically water-free tar is obtained. Finally, the gas, cooled to condense the water, is passed through a third precipitator, in which is obtained an easily separable mixture of oil and water. In the case of gas-production from lignite, 10 per cent. of the total yield of tar is obtained at this point. The gas finally obtained is so pure that fouling of the pipes, and consequent stoppages, do not occur.

The method is also used in the cellulose industry for cleaning the sulphur dioxide, thereby obviating the use of gas-washers and saving 10 per cent. of the sulphur, which was previously lost. Blast-furnace gas may be purified till its total solid content is 0·1–0·003 grams per cubic metre. Other applications are in the cement, plaster of Paris, lime and metallurgical industries.

Peace Uses for War Products

AN article in the *Zeitschrift der Deutschen Öl- und Fett-Industrie* discusses various German war industries which have found peace-time applications. Earlier instances of this kind are the Leblanc soda process, the beet-sugar industry, the preparation of oleo-margarine, and the commencement of cotton culture in Egypt. The main German development of this kind since the war is the nitrogen fixation industry, which needs no further description. Less well known are the results of the war-time shortage of petrol. "Tetralin" and "dekalin," obtained by the hydrogenation of naphthalene, were used as motor-fuels. In peace time these products are in demand in the textile and soap industries. This has given a great impetus to the investigation of hydrogenated products. The soap industry uses "hexalin" and "methylhexalin" (hydrogen products of phenols) and "majamin," the sulpho-acid of "tetralin." The varnish industry makes use of some of the above products, and also of hydroterpin (obtained by hydrogenation of crude turpentine), which is likewise an ingredient of shoe creams.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton, Powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £23 per ton. Powder, £24 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORATE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3⅞d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—3d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4⅜d. to 5¼d. per lb. Crude 60's, 1s. 4½d. to 1s. 6d.

ACID CRESYLIC 97/99.—1s. 6½d. to 1s. 9½d. per gall. Pale, 95%, 1s. 5d. to 1s. 7d. per gall. Dark, 1s. 3½d. to 1s. 5d. per gall. Steady.

ANTHRACENE.—A quality, 3d. to 4d. per unit.

ANTHRACENE OIL, STRAINED.—7d. to 8d. per gall. Unstrained, 6½d. to 7½d. per gall.

BENZOL.—Crude 65's, 1s. 2½d. to 1s. 3½d. per gall., ex works in tank wagons. Standard Motor, 1s. 9d. to 1s. 11d. per gall., ex works in tank wagons. Pure, 1s. 10d. to 2s. 2d. per gall., ex works in tank wagons.

TOLUOL.—90%, 1s. 9½d. to 2s. per gall. Pure, 2s. to 2s. 2d. per gall.

XYLOL.—2s. to 2s. 6d. per gall. Pure, 3s. 3d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. to 10d. per gall. Standard specification, middle oil, heavy, 6½d. to 7d. per gall.

NAPHTHA.—Crude, 9d. to 1s. per gall. Solvent 90/160, 1s. 5d. to 1s. 8d. per gall. Steady demand. Solvent 90/190, 1s. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £3 10s. to £5 10s. per ton. Whizzed or hot pressed, £5 10s. to £7 10s.

NAPHTHALENE.—Crystals and Flaked, £11 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 83s. 6d. to 87s. 6d. per ton, according to district. Lower prices on West Coast. Market active.

PYRIDINE.—90/140, 19s. 6d. to 21s. per gall. Firmer. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—7s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7d. per lb. naked at works.

ANILINE SALTS.—7d. to 7½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb. Good home inquiry.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

o-CRESOL 29/31° C.—3d. per lb. Demand quiet.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—1s. 11d. to 2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLANILINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d. Fair home inquiry.

B-NAPHTHOL.—11d. to 1s. per lb. d/d. Fair home inquiry.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d. Fair home inquiry.

B-NAPHTHYLAMINE.—3s. 9d. per lb. d/d. Fair home inquiry.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 6d. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d. Fair home inquiry.

NITROBENZENE.—5d. to 5½d. per lb. naked at works. Fair home inquiry.

NITRONAPHTHALENE.—10d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 15s. to £9. Firmer. Grey, £17 10s. per ton. Better inquiry. Liquor, 9d. per gall, 32° Tw.

ACETONE.—£81 per ton.

CHARCOAL.—£7 5s. to £9 per ton, according to grade and locality. Demand good.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall., 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. per gall. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P. Very quiet.

WOOD TAR.—£3 to £5 per ton, according to grade.

BROWN SUGAR OF LEAD.—£40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£50 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¼d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£38 10s. to £39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 6d. per lb. Keen competition met. Good demand.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.

ACID, BORIC B.P.—Crystal, £43 per ton; Powder, £47 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 3d. to 1s. 4d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—6s. 7d. per lb. Resublimed, 7s. 3d.

ACID, SALICYLIC.—1s. 3½d. to 1s. 5d. per lb. Technical.—10½d. to 10¾d. per lb.

ACID, TANNIC B.P.—2s. 10d. per lb.

ACID, TARTARIC.—1s. 0½d. per lb., less 5%. Market firm.

AMIDOL.—6s. 6d. per lb., d/d.

ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—12s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—10s. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—12s. 6d. to 14s. 3d. per lb.

BISMUTH CITRATE.—9s. 6d. to 11s. 3d. per lb.

BISMUTH SALICYLATE.—10s. 3d. to 12s. per lb.

BISMUTH SUBNITRATE.—10s. 9d. to 12s. 6d. per lb. according to quantity.

BORAX B.P.—Crystal, £27; Powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 1s. 10d. to 2s. 2d. per lb.; ammonium, 2s. 3d. to 2s. 5d. per lb., all spot.

CALCIUM LACTATE.—1s. 3d. to 1s. 5d.

CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

FORMALDEHYDE.—£40 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—7s. 6d. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. 3d. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.

MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%, price reduced; Heavy Commercial, £23 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

MENTHOL.—A.B.R. recrystallised B.P., 23s. 3d. net per lb., Synthetic, 15s. to 17s. 6d. per lb., according to quality. English make.

MERCURIALS.—Red oxide, 5s. 5d. to 5s. 7d. per lb.; Corrosive sublimate, 3s. 9d. to 3s. 11d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 4s. to 4s. 2d. per lb.

METHYL SALICYLATE.—1s. 5d. to 1s. 7d. per lb.

METHYL SULPHONAL.—16s. 6d. per lb.

METOL.—9s. per lb. British make.

PARAFORMALDEHYDE.—1s. 11d. for 100% powder.

PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.

PHENACETIN.—4s. to 4s. 3d. per lb.

PHENAZONE.—6s. to 6s. 3d. per lb.

PHENOLPHTHALEIN.—4s. to 4s. 3d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—80s. per cwt., less 2½% for ton lots. Market very firm.

POTASSIUM CITRATE.—1s. 11d. to 2s. 1d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb. in cwt. lots. Quiet.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 7½d. per lb., spot, slightly easier.

QUININE SULPHATE.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.

RESORCIN.—3s. 9d. per lb. In fair quantities.

SACCHARIN.—55s. per lb. Fair inquiry.

SALOL.—3s. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923. 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb. carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 80s. per cwt., according to quantity.

SODIUM SALICYLATE.—Powder, 1s. 9d. to 2s. per lb. Crystal, 1s. 10d. to 2s. 1d. per lb. Very heavy demand.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—11s. 6d. per lb. Limited demand.

TARTAR EMETIC, B.P.—Crystal or Powder, 1s. 10d. to 1s. 11d. per lb.

THYMOL.—12s. to 13s. 9d. per lb. Strong demand.

Perfumery Chemicals

ACETOPHENONE.—9s. per lb.

AUBEPINE (EX ANETHOL).—9s. 6d. per lb.

AMYL ACETATE.—3s. per lb.

AMYL BUTYRATE.—6s. 6d. per lb.

AMYL SALICYLATE.—3s. 3d. per lb.

ANETHOL (M.P. 21/22° C.).—6s. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 3d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 3d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 9d. per lb.

CINNAMIC ALDEHYDE NATURAL.—17s. 6d. per lb.

COUMARIN.—11s. 9d. per lb.

CITRONELLOL.—15s. per lb.

CITRAL.—9s. per lb.

ETHYL CINNAMATE.—9s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—9s. 6d. per lb.

GERANIOL (PALMAROSA).—19s. 3d. per lb.

GERANIOL.—7s. to 16s. per lb.

HELIOTROPINE.—6s. per lb.

ISO EUGENOL.—14s. per lb.

LINALOL EX BOIS DE ROSE.—16s. 9d. per lb.

LINALYL ACETATE.—18s. per lb.

METHYL ANTHRANILATE.—9s. 3d. per lb.

METHYL BENZOATE.—5s. per lb.

MUSK KETONE.—35s. per lb.

MUSK XYLOL.—8s. 6d. per lb.

NEROLIN.—4s. per lb.

PHENYL ETHYL ACETATE.—12s. per lb.

PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.

RHODINOL.—28s. 6d. per lb.

SAFROL.—1s. 8d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—21s. 6d. to 23s. 3d. per lb. Good demand.

Essential Oils

ALMOND OIL.—12s. 6d. per lb.

ANISE OIL.—3s. 6d. per lb.

BERGAMOT OIL.—31s. per lb.

BOURBON GERANIUM OIL.—11s. 9d. per lb.

CAMPHOR OIL.—60s. per cwt

CANANGA OIL, JAVA.—16s. per lb.

CINNAMON OIL, LEAF.—5d. per oz.

CASSIA OIL, 80/85%.—10s. per lb.

CITRONELLA OIL.—Java, 85/90%, 3s. 4d. Ceylon, 2s. 4d. per lb.

CLOVE OIL.—7s. per lb.

EUCALYPTUS OIL, 70/75%.—1s. 10d. per lb.

LAVENDER OIL.—French 38/40%, Esters, 22s. 6d. per lb.

LEMON OIL.—10s. 6d. per lb.

LEMONGRASS OIL.—4s. 9d. per lb.

ORANGE OIL, SWEET.—13s. per lb.

OTTO OF ROSE OIL.—Bulgarian, 65s. per oz. Anatolian, 35s. per oz.

PALMA ROSA OIL.—12s. 3d. per lb.

PEPPERMINT OIL.—Wayne County, 11os. per lb. Japanese, 13s. per lb.

PETITGRAIN OIL.—9s. per lb.

SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 18s. 6d. per lb.

Pyrogallic Acid Prices

JOHNSON AND SONS (manufacturing chemists), Ltd. (March 16) write:—"We notice that in your last issue you publish the price of Pyrogallic Acid at 5s. 3d. per lb. Will you kindly note that the market in this chemical has advanced, and to-day's price is:—1 cwt. quantities and over, 6s. 3d. lb.; 56 lb. and under 1 cwt., 6s. 6d. lb.; 28 lb. and under 56 lb., 6s. 9d. lb., with further advances for smaller quantities."

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, March 19, 1926.

THERE is no outstanding feature to report this week, trade continuing on quietly steady lines and demand being for near at hand delivery. Prices continue extremely steady, with several articles in rather short supply. Export trade is slow.

General Chemicals

ACETONE.—A fair demand has been received, and price continues firm at £81 10s. to £83 10s., the forward position is also very firm.

ACID ACETIC.—A fair demand has been received, and price continues without change.

ACID FORMIC continues firm, with the absorption of the cheaper stocks which were recently affecting the market, price for the 85% is about £50, and for 90% about £53.

ACID LACTIC is in satisfactory demand both for home and export account, the price for 50% by weight technical is about £43 10s. per ton, ex wharf U.K.

ACID OXALIC.—Demand still keeps on the small side, with price nominally unchanged at 3¾d. per lb.

ACID TARTARIC.—Only a small business is passing, and price is unchanged at about 11½d. per lb.

ALUMINA SULPHATE.—A fair business is passing, with price steady at £5 15s. per ton for 17/18% quality.

AMMONIUM CHLORIDE is in small demand, and price unchanged at about £18 per ton.

ARSENIC.—No substantial buying is in evidence, although better inquiry is being received, price remains fairly easy, at about £14 per ton.

BARIUM CHLORIDE is on the short side, and price is extremely firm at £10 10s. to £11 5s. per ton, with makers sold for some time ahead.

BARIUM CARBONATE is higher, with a fair demand.

EPSOM SALTS show no change in price, with demand fair.

FORMALDEHYDE is easy owing to the absence of any substantial demand, there are fair stocks available.

IRON SULPHATE continues scarce, with demand sustained for shipment.

LEAD ACETATE has been in steady request, and price is without change on the week at £43 10s. for white, with brown slightly firmer at £42 15s. per ton.

METHYL ALCOHOL.—No change is reported here, the price ranging from £47 to £48 per ton.

METHYL ACETONE is in good request, and price is firm at £59 to £60 per ton.

POTASSIUM CARBONATE is firmer, and inquiry is fairly satisfactory.

POTASSIUM CAUSTIC is unchanged.

POTASSIUM CHLORATE continues scarce for spot delivery, although slightly cheaper prices are being quoted for forward.

POTASSIUM PERMANGANATE.—Slightly easier in price, with demand relatively for small quantities.

POTASSIUM PRUSSIATE is moving satisfactorily, and there are now large stocks, price is steady at 7¼d. per lb.

SODIUM ACETATE continues scarce, both for spot and near forward, and small stocks are quoted at 21s. to 22s.

SODIUM BICHROMATE is only in small demand, with imported make competing keenly with the home article.

SODIUM CHLORATE continues firm and scarce.

SODIUM NITRITE is slightly easier at £21 10s. per ton.

SODIUM PHOSPHATE is in steady request at £14 per ton.

SODIUM PRUSSIATE is slightly better, demand has been received for export, and price shows no change at 4½d. per lb.

SODIUM SULPHIDE remains easy under stress of continental competition.

Coal Tar Products

There is little change to report in the market for coal tar products, the market generally maintaining a firm tone.

90% BENZOL is in good demand, and is quoted at 1s. 9½d. per gallon on rails, the motor quality being quoted at the same price.

PURE BENZOL is unchanged at 2s. 1d. to 2s. 2d. per gallon on rails.

CREOSOTE OIL has a somewhat lessened demand, and the price on rails is from 5¾d. to 6d. per gallon on rails in the North, while the price in London is from 6¾d. to 7d. per gallon on rails.

CRESYLIC ACID is quoted at from 1s. 10d. to 2s. per gallon on rails for the pale quality 97/99%, for export to America, while the dark quality 95/97% is quoted at 1s. 8d. to 1s. 9d. per gallon on rails. The home trade prices remain unchanged, at 1s. 6d. per gallon on rails for the pale quality, and 1s. 4d. per gallon on rails for the dark quality.

SOLVENT NAPHTHA is steady at 1s. 5d. per gallon on rails.

HEAVY NAPHTHA is quoted at 1s. to 1s. 1d. per gallon on rails.

NAPHTHALENES.—The demand for naphthalene is hardly so steady, and prices are easing somewhat. The lower grades are worth from £3 10s. to £4 5s. per ton, 76/78 quality about £6 per ton, and 74/76 quality about £5 to £5 10s. per ton.

PITCH remains firm, and quotations remain at 85s. to 90s. per ton f.o.b. U.K. ports. Little business has been reported lately, however, as buyers are apparently beginning to hesitate to follow the rise in value.

Latest Oil Prices

LONDON.—LINSEED OIL firm and 5s. to 7s. 6d. higher. Spot, £30 15s., ex mill; March and April, £29 10s.; May-August, £29 12s. 6d.; September-December, £30. RAPE OIL quiet. Crude-crushed, spot, £47 10s.; technical refined, £49 10s. COTTON OIL steady. Refined common edible, £42; Egyptian, crude, £35 10s.; deodorised, £44. TURPENTINE steady at 3d. per cwt. advance for near, American spot, 65s.; April 65s. 3d.; May-June, 64s.; and July-December, 61s.

LIVERPOOL.—LINSEED.—The market was steady. La Plata, April-May, £14 5s. per ton, sellers. PALM KERNELS steady; February-April sold at £20 5s., and March-May at £20 3s. 9d. per ton. PALM OIL quiet, Lagos, spot, £38, sellers. Soft, spot, quoted £37 15s, and April-May, £37 7s. 6d., with May-June sold at £37 5s. Medium, spot, quoted £38 10s.; near, £38 5s.; and May-June, £38. Hard, near, quoted £38 5s. to £38 10s. per ton. TURPENTINE easier. American, on the spot, quoted 68s. per cwt., ex store.

Nitrogen Products Market

Export.—During the last week the demand for sulphate of ammonia has continued satisfactory and substantial quantities have changed hands on the basis of £12 10s. per ton, f.o.b. U.K. port. The Continent and the Far East have been buyers.

Home.—The continued purchasing by farmers is reported from all parts of the country. In some parts of the country producers are hard put to meet the current demand. Prices remain unchanged. The announcement of prices for the whole season in December last seems to have had a stabilising effect on the demand. It appears that the consumption for the year will be well above that of last year.

Nitrate of Soda.—The market continues firm. Cargoes c.i.f. chief European ports have changed hands at about £11 13s. per ton for prompt arrival, and similar prices for April arrival.

Salt Union Action

IN the Chancery Division on Wednesday, Mr. Justice Tomlin, after a hearing lasting ten days, reserved judgment in the action brought by the Salt Union for a declaration that they were entitled to all the waste heat from the blast furnaces of Dorman, Long and Co., Middlesbrough, for the purpose of their salt production. The case turned upon the meaning of "waste heat" in an agreement of July, 1900, between the Salt Union and Bell Bros. (acquired in 1923 by Dorman, Long and Co.), the former claiming that it included the live gas from the furnaces, while Dorman, Long and Co. contended that it meant merely the heat that was left from the boilers.

Chemical Tenders Accepted

RECENT chemical tenders accepted include:—International Electrolytic Plant Co., Ltd., Chester, a repeat order from the Société des Engrais Azotes et Composes, Pierrefitte, for 200 Knowles patent cells; 50 Knowles cells for the International Oxygen Co., Newark, N.Y., and 63 large cells for an English firm. Brunner Mond and Co., Ltd., has secured the supply of soda ash for one year to Saffron Walden T.C., at £7 12s. per ton; tar, 8,000 gals., for Carrickfergus U.D.C., J. M'Neill, Ltd., Belfast, 8½d. per gal. Erection and fitting of laboratory, etc., at Chesterfield Sewage Works, W. Moss and Sons, £1,840. Gas works plant, for Esbjerg, Denmark, Woodall-Duckham Vertical Retort and Oven Construction Co. (1920), Ltd., £20,000 approximately. Fairfield-Howden Ruths Steam Accumulators, Ltd., Glasgow, for the Ruths Steam Accumulator, have received orders from Anglo-Scottish Beet Sugar Corporation, Ltd., Nottingham, for Colwick Estate Factory, 17,500 lb. steam capacity, 4,300 cu. ft. volume; Glasgow Corporation Chemical Works Department, Provan Chemical Works, 10,000 lb. steam capacity, 3,200 cu. ft. volume.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, March 19, 1926.

BUSINESS in the heavy chemical market continues fairly active, quite good inquiry being received both for home and export. There are no notable changes in prices to record, although some products remain very short on spot, notably acetate of soda. The prices of Sicilian sulphur have also been increased by the Syndicate.

Industrial Chemicals

ACID ACETIC, 98/100%.—Quoted £55 to £67 per ton according to quantity and packing, c.i.f. U.K. port; 80% pure, £40 to £41 per ton; 80% technical, £38 to £39 per ton, packed in casks, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated, or small flakes, £37 per ton; powdered, £39 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 5½d. per lb., delivered or f.o.b. U.K. port. Good inquiry.

ACID CITRIC, B.P. CRYSTALS.—Usual steady demand and price unchanged at about 1s. 3¾d. per lb., less 5%, ex wharf.

ACID FORMIC, 85%.—Spot material quoted about £49 15s. per ton, ex store. Offered from the continent at about £49 per ton, ex wharf, prompt shipment.

ACID HYDROCHLORIC.—In little demand; price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Remains unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Offered from the continent at 3⅝d. per lb., c.i.f. U.K. ports. Spot material quoted 3⅞d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 11¼d. per lb., less 5%, ex wharf, early delivery.

ALUMINA SULPHATE, 17/18% IRON FREE.—Some cheap offers to hand from the continent. Quoted £5 9s. per ton, c.i.f. U.K. ports. Spot material available at about £6 5s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £7 12s. 6d. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £9 per ton, ex store. Powdered quality offered for prompt shipment at about £7 10s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Imported material quoted 1s. 1d. per lb., ex wharf. Prompt shipment, containers extra and returnable. This price could probably be shaded for fairly large quantities.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton; packed in 5 cwt. casks, delivered or f.o.b. U.K. ports. Industrial quality about £10 per ton less.

AMMONIA LIQUID 880.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £25 to £26 per ton, ex station. On offer from the continent at about £22 per ton, c.i.f. U.K. ports. Fine white crystals offered from the continent at about £18 12s. 6d. per ton, c.i.f. U.K. ports.

ARSENIC.—Spot material still available at £17 per ton, ex store. Offered for prompt despatch from works at about £16 15s. per ton, ex wharf.

BARIUM CHLORIDE, 98/100%.—Higher quotations from the continent; now quoted £10 per ton, c.i.f. U.K. ports, prompt shipment.

BLEACHING POWDER.—English material quoted £9 10s. per ton, ex station. Contracts 20s. per ton less. On offer from the continent at about £7 10s. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals, £23 per ton; powdered, £24 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. station. Continental quality, £4 17s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Quoted £3 17s. 6d. per ton, f.o.b. U.K. ports for export. About £3 10s. per ton, f.o.r. works for home consumption.

COPPER SULPHATE, 99/100%.—Price for British material £23 10s. per ton, f.o.b. U.K. ports. Moderate inquiry for export. Continental on offer at about £22 per ton, ex wharf.

FORMALDEHYDE 40%.—Spot material available at £38 10s. per ton, ex store. Offered for prompt shipment at £37 10s. per ton, c.i.f. U.K. ports.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental on offer at about £3 per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals on offer from the continent at about £42 10s. per ton, c.i.f. U.K. ports. Brown quoted about £38 5s. per ton, c.i.f. U.K. ports. Spot material available at about £44 per ton, ex store.

LEAD, RED.—Imported material on offer at about £40 per ton, ex store. Quoted £39 15s. per ton, c.i.f. U.K. ports, to come forward.

LEAD, WHITE.—On offer at £40 15s. per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex station; in moderate demand.

POTASH CAUSTIC 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton, c.i.f. U.K. ports, according to quantity and destination. Spot material available at about £29 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE 96/98%.—Offered from the continent at about £25 5s. per ton, ex wharf, prompt shipment. Spot material available at about £26 10s. per ton, ex store. 90/94% quality quoted £22 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE.—98/100% crystals offered from the continent at about £30 5s. per ton, c.i.f. U.K. ports. Spot material available at £31 10s. per ton, ex store. Powdered quality quoted £28 5s. per ton, c.i.f. U.K. ports, prompt shipment.

POTASSIUM NITRATE, SALTPETRE.—Quoted £22 15s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £25 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Spot material quoted 8d. per lb., ex store. Offered for early delivery at 7¾d. per lb., ex wharf.

POTASSIUM PRUSSIATE, YELLOW.—In moderate demand. Spot material quoted 7¼d. per lb., ex store, but could probably be obtained for less. On offer for prompt shipment from the Continent at 7d. per lb., c.i.f. U.K. port.

SODA CAUSTIC.—76/77%, £17 10s. per ton; 70/72%, £16 2s. 6d. per ton; broken, 60%, £16 12s. 6d. per ton; powdered, 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—Still very scarce for spot delivery, quoted £20 15s. per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station; M.W. quality, 30s. per ton.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb., delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more; alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 per ton, ex station. Minimum 4-ton lots. Pea crystals, £14 5s. per ton, ex station. Continental commercial quality offered £9 per ton, ex store.

SODIUM NITRATE.—Quoted £13 per ton, ex store; 96/98% refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton, ex store. Offered from the Continent at about £22 5s. per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—In steady demand and spot material now quoted about 4¼d. per lb., ex store. Offered for prompt shipment from the Continent at about 4d. per lb., c.i.f. U.K. port.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—60/62% solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per.ton; crystals, 31/34%, £8 12s. 6d. per ton; all delivered buyers' works U.K. minimum 5-ton lots with slight reduction for contracts. 60/62% solid quality offered from the Continent at about £10 per ton, c.i.f. U.K. ports. Broken £1 per ton more. Crystals, 30/32%, £7 per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £11 5s. per ton; roll, £10 per ton; rock, £10 per ton; ground, £9 15s. per ton, ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material, 96/98% quoted £23 15s. per ton, f.o.b. U.K. port; 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton extra.

ZINC SULPHATE.—Continental manufacture on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

BETA NAPHTHOL.—11d. to 1s. per lb. Some home inquiries.

DIMETHYLANILINE.—1s. 11d. per lb. Some home inquiries.

PARANITRANILINE.—1s. 9d. per lb. Fair home inquiries.

H. ACID.—3s. 3d. per lb. per 100%. Small home inquiries.

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some home inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, March 19, 1926.

The best that can be said of the Manchester chemical market just now is that trade is moderate. Actual business during the week has not been important and whilst inquiry is reported to have been on a fair scale by some firms it has, in the main, been for comparatively small parcels. This applies both to the home trade and for shipment, for business on overseas account is anything but brisk. As far as values are concerned, the general trend seems to be towards steadiness, for in respect of only a few lines of chemicals are prices easy.

Heavy Chemicals

Commercial hyposulphite of soda is about maintained at £9 10s. per ton, with photographic material at £14 to £14 5s. per ton; inquiry for this has been on modest lines. Bichromate of soda continues to meet with a rather limited demand but the value remains unchanged at 3¼d. per lb. Bicarbonate of soda is quiet but steady at £10 10s. per ton. Acetate of soda is in moderate request and quotations are quite firm, £21 to £21 10s. per ton now being asked for this material. Phosphate of soda is rather dull at £12 10s. to £12 15s. per ton. Sulphide of sodium is quiet but fairly steady at £11 5s. to £11 15s. per ton for 60–65 per cent. concentrated solid and £9 12s. 6d. for crystals. Caustic soda is held at from £15 2s. 6d. per ton for 60 per cent. strength to £17 10s. for 76–77 per cent., and inquiry for this is fairly good. Saltcake is still rather quiet at about £3 per ton, with glauber salts in a somewhat similar position at round £3 5s. Alkali keeps steady and in fair request at £6 15s. per ton. Bleaching powder shows no change in price, which is still round £8 10s. per ton, and demand is on a moderate scale. Soda crystals are in quiet request at £5 5s. per ton. Chlorate of soda is rather slow just now at about 3¼d. per lb.

Caustic potash is not meeting with a very active demand but the quotations for this material are fully steady at about £27 10s. per ton for 90 per cent. strength, while carbonate of potash is firm at £26 10s. per ton for the 96 per cent. quality and is in fair request. Bichromate of potash is still on offer at about 4¼d. per lb. but there is still only a limited amount of business being put through. Chlorate of potash is rather quiet but values are steady at 4d. per lb. Yellow prussiate of potash is firm at about 7¼d. per lb. The demand for permanganate of potash is slow, with commercial material quoted at about 5¼d. per lb. and the B.P. quality at 7d. to 7¼d. per lb.

Both home and foreign inquiry for sulphate of copper continues limited but the price is steady at about £24 5s. per ton. Arsenic shows little or no improvement; quotations for white powdered, Cornish makes, seem to be quite steady, however, at about £14 per ton, on rails. Commercial Epsom salts are unchanged at £3 15s. to £4 per ton, and magnesium sulphate, B.P. quality, at round £4 10s. Nitrate of lead is slow but values keep up at from £40 to £41 per ton. Acetate of lead is also very steady at £43 10s. per ton for white and £39 to £40 per ton for brown. Grey acetate of lime is in limited demand at £17 5s. per ton, with brown at about £8 5s.

Acids and Tar Products

The price of acetic acid keeps very steady although business in this material cannot be described as active at the moment; 80 per cent. commercial is quoted at about £37 10s. per ton and glacial at round £67. Oxalic acid is in moderate inquiry at about 3¾d. per lb. Citric acid is quiet but steady at 1s. 3¼d. per lb., with tartaric acid also a rather slow seller at 11¼d. per lb.

Among the coal-tar products there is little movement passing in the case of carbolic acid; crystals continue to be quoted at 5d. to 5¼d. per lb. and crude at about 1s. 5d. per gallon. Solvent naphtha is in moderate demand at round 1s. 6d. per gallon. Creosote oil is maintained at about 6¼d. per gallon, but inquiry has been slow. Pitch keeps very firm on continued buying and not far from £4 per ton has been mentioned as the current Manchester price, f.a.s.

United Alkali Results

Comparison of Figures

As was the case in 1924, the United Alkali Co.'s works were generally well employed during the past year. The figures for the past three years are shown in the following table:—

	1925.	1924.	1923.
	£	£	£
Net profit	391,089	472,812	352,332
Brought forward	100,391	102,846	86,735
Available	491,476	575,658	439,067
To reserves	100,000	150,000	100,000
Debenture redemption	—	15,000	15,000
Preference dividend	197,767	197,767	153,700
Ordinary dividend	90,000	112,500	67,521
Ditto per cent.	10	12½	10
Carried forward	103,709	100,391	102,846

A combined report was issued for the years 1921 and 1922, the profit for the period being £578,213. The bonus shares then distributed absorbed £300,000, the reserve received £76,990 and the debenture redemption fund £30,000, and the ordinary shareholders a dividend of 10 per cent.

The meeting will be held on Wednesday next week, and a report will appear in The Chemical Age of March 27.

Pyridine as a Denaturant

Some letters on the question of the effects of pyridine in methylated spirit have appeared in the *Birmingham Post* last week. Mr. R. M. D. Hodge, writing from Holloway Head, stated that, in his opinion, pyridine was of a highly poisonous nature and acted as a violent irritant to the skin. He understood that the percentage of cancerous cases was greater where pyridine was used than in any other industry. He considered that the new Customs and Excise regulations would disorganise the lacquer trade.

Mr. J. C. Mann, of Midland Tar Distillers, Ltd., Exchange Buildings, wrote that he had been closely associated with the manufacture of pyridine for the last 40 years, and had not suffered in any way in consequence. He had never come across a case in which workmen engaged in its manufacture had been any the worse for it. In this instance he was speaking of pyridine itself and not a dilute solution of it. If any harmful results were occasioned from the fumes of spirit denatured with pyridine, these must be attributed to something other than the one half of one per cent. of the denaturant referred to. The use of pyridine as a denaturant for spirit was by no means new. It had been a recognised denaturant for over 30 years in Germany and other Continental countries, and in the States since 1907.

Tariff Changes

Franco-German Agreement.—An agreement in operation provisionally from March 1, provides that if France, during the period of the arrangement, increases by 30 per cent. the duties applicable to any weight of (ex Tariff No. 522) chlorates of barium, potash, and soda (No. 046) and formic acid (ex No. 0214), these products when originating in and coming from Germany, shall enjoy minimum tariff treatment. In the case of an increase of the duties by 30 per cent., zinc oxide (No. 0175) shall enjoy a reduction of 86 per cent., oxalic acid (No. 0227) a reduction of 89 per cent., and sodium hyposulphite containing 65 per cent. or more of anhydride (ex No. 080) a reduction of 90 per cent.

Palestine.—Copra is now free of import duty as from December 1, 1925.

Austria.—An Austro-Swiss agreement giving effect to the following alterations which are applicable to U.K. goods.—Chlorates and perchlorates of potash and soda, 10 gold crowns per 100 kilogs (formerly 15); metaldehyde, solid 25 gold crowns per 100 kilogs (formerly 10 or 15 per cent. *ad. val.*); barium chlorate, 10 gold crowns per 100 kilogs. (formerly 10 or 15 per cent. *ad val.*).

Syria and Lebanon.—The following may now be imported duty free.—Sulphurators of all kinds, disinfecting materials, chemical fertilisers and manures.

Italy.—Glucose, maltose, and their syrups, and invert sugar are now exempt from internal manufacturing tax and corresponding import surtax.

Company News

UNITED ALKALI CO., LTD.—A report appears on page 285.

UTAH COPPER.—A dividend of $1.25 is payable on March 31.

GRASSELLI CHEMICAL CO.—The report for 1925 shows net profits of $4,154,514.

BROKEN HILL SOUTH.—The revenue for the half-year ended December 31 is estimated at £795,000, and working expenses at £485,000, leaving a surplus of £310,000.

PARKES CHEMISTS.—A final dividend on the preference shares for the half-year ended February 28, 1926, at the rate of 6 per cent. per annum, less income tax, is announced, payable on March 20.

DOMINION TAR AND CHEMICAL CO.—A final dividend of 5¾ per cent. is announced on the ordinary shares, making 11¼ per cent. for the past year. £15,000 is allocated for depreciation, and £1,948 is carried forward.

ENGLISH MARGARINE WORKS.—A dividend of 7 per cent. per annum has been declared on the cumulative participating preference shares in respect of the two years ending December 31, 1924, and December 31, 1925, both less income tax at 4s. 1½d. in the £.

NEW TAMARUGAL NITRATE CO.—The net profits for the year ended July 31 were £189,776. A final dividend of 25 per cent. has been paid, making 35 per cent. for the twelve months, and it is proposed to add £20,000 to the amortisation fund, carrying forward £66,037.

SYNTHETIC AMMONIA AND NITRATES, LTD.—The report for 1925 shows a profit on the trading accounts, after charging depreciation, of £103,002, to which is added £2,333 for rents, etc., making £105,335. The net profit amounted to £103,647, reducing the adverse balance at December, 1924, to £66,580.

BARRY, OSTLERE AND SHEPHERD, LTD.—The directors have decided to recommend a final dividend of 10 per cent., making, with the 5 per cent. interim dividend, 15 per cent. for the year, and a bonus of 2s. per share, both less tax, on the ordinary share capital. A sum of £105,000 has been placed to reserve and £117,588 is carried forward.

NEW TRANSVAAL CHEMICAL CO.—For the twelve months ended June 30, 1925, the profits totalled £47,897, as against £39,196. The depreciation account receives £11,219, and after providing for the preference dividends, requiring £24,000, the directors propose paying the London board £630, leaving to carry forward £28,686, compared with £16,639 brought in.

UNITED GLASS BOTTLE MANUFACTURERS.—Including provision for taxation in previous accounts not now required, the net profits for 1925 were £100,552, and £171,584 was brought forward. A dividend at the rate of 5 per cent. per annum is proposed on the ordinary shares for the six months ended December 31 last, carrying forward £41,363.

JOSEPH NATHAN AND CO.—For the year ended September 30 last a net profit of £50,693 is reported, compared with £32,118 for the previous year. One year's dividend to July 1 last has been declared on the 7 per cent. preference shares. The dividend on the 8 per cent. preferred ordinary shares remains in arrear as from September 22, and no dividend has been paid on the ordinary shares since 1921-22, when 8 per cent. was declared.

PINCHIN, JOHNSON AND CO., LTD.—After providing for all expenses, depreciation of leasehold properties, plant, machinery, etc., and after providing for income tax, amounts to £112,276. The directors propose to pay a final dividend on the ordinary shares of 20 per cent. actual, making a total of 30 per cent. for the year; to carry to reserve the sum of £15,000 and to carry forward to 1926 £30,519. The annual meeting will be held in London on March 23, at 11.30 a.m.

SALT UNION, LTD.—A net profit of £273,843 is reported for the year ended December 31 last, which, after adding the balance of £62,409 brought forward, and deducting the debenture interest £42,368, leaves an available balance of £293,884. A dividend of 2s. 6d. per share (12½ per cent.) is proposed on the ordinary shares, adding £50,000 to the reserve, £40,000 to contingencies account, and carrying forward £23,884.

BRITISH ALUMINIUM, LTD.—The profit for the year to December 31 last, including the amount brought forward, after making provision for taxation, etc., and setting aside £50,000 to depreciation reserve and £150,000 to reserve fund, is £168,062. The directors recommend a final dividend at the rate of 12 per cent. per annum on the ordinary shares, making 10 per cent. for the year, together with a bonus of 2½ per cent., leaving £24,959 to be carried forward.

ENGLISH CHINA CLAYS, LTD.—For the year ended December 31 last the profits amounted to £83,019, to which has to be added the amount brought forward of £11,543, making £94,562. After allowing for the preference dividend the directors recommend a final dividend of 2½ per cent., making 4½ per cent. for the year on the ordinary shares, and transferring to general reserve £5,000, leaving to carry forward £11,175. The annual meeting will be held in London on March 30, at noon.

MIRRLEES, WATSON CO. OF GLASGOW.—A scheme has been formed for the complete amalgamation of the Mirrlees, Watson Co., of Glasgow, and Mirrlees, Bickerton and Day, of Stockport. Under the scheme the Glasgow company is to sell and transfer to the Stockport company all its business and assets with the exception of £50,000 in cash and 36,000 shares held by the Glasgow company in the Stockport company. The purchase consideration is 244,000 fully-paid ordinary shares of the Stockport company, ranking for dividend from April 1, 1925. These, together with the 36,000 shares already held and the £50,000 mentioned, will enable the Glasgow company to give its shareholders 7 ordinary shares in the Stockport company for each 5 shares in the Glasgow company and a capital repayment of 5s. per share in the event of liquidation and distribution of assets.

SOUTHALL BROS. AND BARCLAY, LTD.—After providing for bad debts, depreciation, taxes, etc., and a cash bonus of £3,000 to employees, the accounts for the year ended December 31 last show a balance of profit of £42,209. The sum of £27,922, which was carried forward last year, makes a total of £70,131. A dividend on the ordinary shares at the rate of 10 per cent., free of tax, is recommended, plus a bonus of 6d. per share, also free of tax; and after carrying to reserve a sum of £20,000, there remains a balance to be carried forward to next account of £31,211. It is also proposed to distribute amongst the ordinary shareholders, by way of bonus, one ordinary share for every five ordinary shares held, fractions to be discharged in cash at the rate of 20s. per complete share. The necessary capital for the purpose (£21,472) will be transferred from the company's internal reserve. The annual meeting of shareholders will be held on March 23, at 12 noon, at the Chamber of Commerce, New Street, Birmingham.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

TAR.—Refined tar or bituminous compound, for Maldon T.C. Forms from Borough Engineer, returnable by April 6. Road Board No. 1 tar, 6,000 gals., for Ripponden, Yorks. Tenders to Surveyor, Council Offices, by March 27.

BENZOL, ETC.—Commission agent in Berlin wishes to represent British manufacturers or exporters of benzol, benzine, gasoline, and turpentine. (Reference No. 309.)

PAINTS, ETC.—A firm in Porto Alegre, Brazil, wish to represent British firms for sale of paints and varnish. (Reference No. 328.)

DISINFECTANT POWDER.—The South African Railways and Harbour Administration invite tenders for supply of 63,900 lb. of disinfectant powder. Details on application. (Reference B.X. 2,411.)

SOAP MATERIALS.—A French agent in Paris wishes to represent British manufacturers of acid oils, fatty acids, stearines, oleines, and soap fats and exporters of Australian tallow. (Reference 345.)

CHEMICALS.—Commission agents in Stockholm wish to represent for Sweden, British manufacturers of soda sulphate and bisulphate, red and white lead, zinc white, aniline dyes, caustic potash and soda, chloride of lime, oleic acid, and linseed oil. (Reference No. 356.)

Agents in New York wish to handle British chemicals on a consignment basis. (Reference No. 358.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

HANDFIELD CHEMICAL CO., Boothfold, Waterfoot, chemical manufacturers. (C.C., 20/3/26.) £10 11s. 8d. February 11.

PATERSON AND CO. (DYERS AND FINISHERS), LTD., Holbeck Mills, Holbeck, dyers and finishers. (C.C., 20/3/26.) £16 7s. February 10.

RIGBY (J. J.), LTD., Regent Soap Works, Comus Street, Salford, soap manufacturers. (C.C., 20/3/26.) £27 0s. 6d. February 12.

Bill of Sale

CLEARE, Charles Malcolm, 40, Beaconsfield Road, New Southgate, aluminium paint manufacturer. (B.S., 20/3/26.) Filed March 13. £110.

London Gazette, &c.

Winding Up Petitions

KEENE'S TRADING CO., LTD. (W.U.P., 20/3/26.) A creditor's petition for winding-up has been presented, and is to be heard at the Royal Courts of Justice, Strand, London, on March 23.

MIDLOTHIAN CHEMICAL CO., LTD. (W.U.P., 20/3/26.) A petition for winding-up has been presented at the instance of C. Wishart, Hall and Co., manufacturers, Elder Park Works, Govan, Glasgow.

Business Names Registered

[*The following (trading name and address, nature of business, date of commencement, and proprietors' names and addresses) have been registered under the Registration of Business Names Act.*]

BALMEZE CO., 35, High Street, Langley, Birmingham, manufacturing chemists. Benjamin J. Wood, Ernest Cooper, and Frederick Charles Shakespeare.

MAJIK POLISH CO., 57, Whitehall Road, Bristol, ointments, powders, and various domestic liquids. William Simmons.

VERICLEAN PRODUCTS, 27, Great Pearl Street, Bishopsgate, E., manufacturers of polishes. March 1, 1926. William C. Shortland.

WEST LONDON METAL REFINING CO., 79, High Street, Brentford, Middlesex, metal refiners. January 25, 1926. Walter Ed. Deeks, 41, Clifden Road, Brentford; Wm. Henry Clark.

New Companies Registered

BRITISH LABORATORIES, LTD., 27, Walbrook, London, E.C.4. Registered March 10, 1926. Manufacturers of and dealers in chemical, industrial and other preparations, drugs, oils, soap, varnishes, paint, turpentine, synthetic products, etc. Nominal capital, £10,000 in 9,500 8 per cent. cumulative participating preference shares of £1 each and 10,000 ordinary shares of 1s. each.

MIDLAND PAPER STAINING CO., LTD. Registered March 5, 1926. Wholesale and retail manufacturers and dealers in all kinds of wall paper, paints, varnishes, etc. Nominal capital, £5,000 in £1 shares. A director: S. H. A. Silverter, 7, Sykefield Avenue, Leicester.

THE "SANITAS" TRUST, LTD., 21, Ironmonger Lane, London, E.C.2. Reg. March 11, 1926. To acquire the whole of the issued ordinary share capital of the Sanitas Company, and all the issued capital of W. Woodward, Ltd. Nominal capital, £500,000 in 490,000 8 per cent. cumulative preference shares of £1 each and 200,000 ordinary shares of 1s. each.

Lead Paint Bill

New Regulations

THE text was issued on Wednesday of the Lead Paint (Protection against Poisoning) Bill, introduced by Sir William Joynson-Hicks, to make better provision for the protection against lead poisoning of persons employed in painting buildings. The Home Secretary is given power to make regulations:—

(*a*) For prohibiting the use of any lead compound except in the form of paste or of paint ready for use.

(*b*) For the prevention of danger arising from the application of lead paint in the form of spray.

(*c*) For the prevention as far as practicable of danger arising from dust caused by dry rubbing down and scraping.

(*d*) For providing for the medical examination of persons employed in or in connection with painting with lead paint, and for the suspension from such employment of persons whose health is or appears likely to be injuriously affected thereby.

(*e*) For securing that facilities for washing during, and on cessation of, work are afforded to persons employed in painting.

(*f*) For the use of protective clothing by persons so employed and for preventing clothes left off during work from being soiled by paint, and

(*g*) For the distribution to persons so employed of instructions with regard to hygienic precautions to be taken.

Clause 2 prohibits, after November 19, 1927, the employment of women and young persons in painting buildings with lead paint, with the exception of apprentices in the painting trade under approved arrangements, and women or young persons engaged in decorative or other work excluded from the provisions of this section by an order of the Secretary of State. Another clause gives power to an inspector under the Factory and Workshops Act to take samples.

Artificial Silk Developments

THE capital of La Soie Artificielle de Calais is 10,000,000 f., and a working *entente* has been entered into with the Soieries de Strasbourg, with which company Professor Emil Bronnert is connected. The capital of the latter firm is being increased from 20 to 36 million francs.

A company named S. A. de Soie Artificielle has been formed from French and Greek capital with works near Athens. The estimated output is about 1,500 lb. per day, and the capital 7,000,000 drachmæ. The machinery is to be largely German.

The Viscosa Co. are to erect a factory at Burton-on-Trent. A factory is to be erected at Mediasch, Roumania, to commence production in August at 12,000 lb. per day. Italian interests predominate. Dumoulin, Jacquemin and Co., Lombardy, are now operating the cellulose acetate process.

Lime in Industry

THE report of the 1925 Convention of American National Lime Association contains an account of various investigations which are being carried out under the auspices of the Association. Encouraging results are described in an article on "Lime in Dirt Roads." A number of clay roads subject to heavy traffic were treated with hydrated lime. The formation of mud and ruts in wet weather was greatly reduced, though the production of dust was not lessened, and in some cases increased. Tests are also being carried out on the use of hydrated lime as a mineral filler in asphalte paving mixtures. A long paper on "Kiln Capacity and Fuel Economy" was read by V. J. Azbe, and among other reports are those dealing with the prevention of stream pollution, and with soil liming. The American Society for Testing Materials is preparing specifications for lime for various uses.

The Association has also issued a bulletin (48 pp.) on the use of lime in water softening, sterilisation, colour removal, production of non-corrosive water, etc. In a discussion of the cost of impurities in locomotive water supply and the value of water treatment, it is mentioned that on one railway the saving on engine repairs ran into $1,647 per engine, while in another case, where particularly bad water conditions prevailed, the saving rose as high as $5,000. The bulletin also discusses certain formulæ used by waterworks superintendents, giving practical examples of their use.